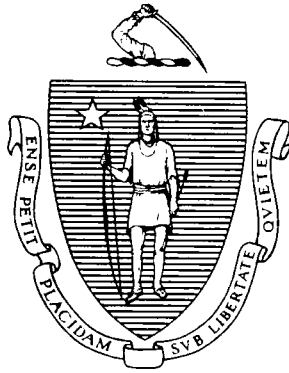


Commonwealth of Massachusetts

Division of Public Employee  
Retirement Administration



INVESTMENT REPORT  
MASSACHUSETTS CONTRIBUTORY RETIREMENT  
SYSTEMS FOR PUBLIC EMPLOYEES

DECEMBER 31, 1989

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MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
FOR PUBLIC EMPLOYEES

INVESTMENT REPORT

December 31, 1984 through December 31, 1989

PERA is pleased to release the 1989 Investment Report detailing the investment performance of the Massachusetts Contributory Retirement Systems. This report marks the fifth consecutive year that PERA has reviewed the investments of the public pension sector in Massachusetts. Returns in the financial markets during this period have in general demonstrated positive growth, with the obvious exception being the stock market decline of October 1987. In 1989 these favorable trends continued. The 31.68% return of the S&P 500 Stock Index in that year was the largest gain posted since 1985 and the returns of the fixed income indices and the Treasury bill rate far exceeded the rate of inflation for the year. We are pleased to report that the contributory retirement systems have benefited from these favorable market conditions, and as the new decade of the 1990's begins, retirement systems find themselves well positioned for the future. In 1989, the Massachusetts Contributory Retirement Systems achieved a rate of return of 15.62%. On an annualized basis the return for the 1985-1989 period was 12.94%, 494 basis points above the actuarially assumed rate of return of 8%. One hundred and two of the 106 systems achieved a total return above 8%. In addition, the growth of the assets of the Massachusetts Contributory Retirement Systems has been significant over the 1985-1989 period with the assets of the Massachusetts Contributory Retirement Systems doubling from \$5.8 billion in 1985 to \$11.6 billion in 1989.

In reporting on the 1989 investment performance, however, our focus has changed from the analysis offered in previous PERA Investment Reports. In each of our previous reports we have compared the investment performance of the retirement systems which invested pursuant to the legal list restrictions of Chapter 32 to the returns of systems investing according to the prudent person standard. Each year we have noted that more and more systems chose to retain professional investment managers to manage their assets, and our analysis indicated that the returns of systems with investment managers exceeded the returns of those systems investing pursuant to the legal list standard. This trend to transfer the management of public pension assets from internal to professional management has evolved to the point where the legal list - prudent person analysis is less relevant today than ever before. At this writing, as we embark upon a new decade, only 10 systems do not invest according to the prudent person standard, and there are indications that this number will decrease in the coming months. In 1985, and to a lesser extent in each of the subsequent years, the question that retirement boards were most apt to consider was whether to retain an investment manager and seek a prudent person exemption from the statutory investment restrictions of Chapter 32

and the legal list. In 1990, the question is increasingly the degree to which a board should further diversify its portfolio by including not only alternative investments but also different management styles. Whereas the typical retirement system portfolio in 1985 was managed by a single core investment manager, recent trends point toward the retention of both core and specialty managers and the adoption of more sophisticated investment strategies. These trends are indeed significant and clearly indicate that in a very short period of time Massachusetts public pension systems have, in the interest of enhancing return while diversifying risk, aggressively pursued modern investment strategies.

This further diversification of portfolios and the retention of additional managers increases the importance of investment performance analysis. This report marks the fifth year that performance has been calculated and this period provides a sufficient time frame to evaluate the investment performance of the systems and their managers. In each of our reports we have stressed the importance of evaluating performance over long time horizons to accommodate at least one complete business cycle. Sufficient data now exists to begin this evaluation.

It is important to remember in reviewing and evaluating investment performance that such an evaluation must extend far beyond the cursory review of relative rankings. The true measure of success is not based on a comparison of performance with other systems but is measured in each system's ability to meet its investment objectives. These objectives are unique to each system and will obviously differ among systems, as investment strategy must reflect asset size, funding status, return objective, risk tolerance and many other considerations. The same is true of investment managers. A determining feature should be the manager's ability to provide the level of performance which was set as a goal at the time of hiring.

This brings us to investment planning, the establishment of objectives and the role of asset allocation. The asset allocation process cannot be understated in terms of importance to a system's investment performance, and many experts identify asset allocation as the key element of that performance. Over long periods of time the commitment of assets to broad categories has a far greater impact on long-term performance than the individual securities which comprise a portfolio at a particular moment. It is also important that the boards set appropriate investment goals, for if the goals which are met are inappropriate, the results will be unsatisfactory. Board members must use performance results to evaluate whether the system's asset allocation is appropriate for its needs and objectives and whether adjustments to these allocations are appropriate. In short, although comparative performance is always interesting, this report should be used by each board to assess whether:

- 1) performance over the 1985-1989 period met the return objectives set by the board,

- 2) if performance did meet these objectives, are the investment objectives themselves appropriate,
- 3) did investment managers achieve the return expected over this period, and
- 4) if investment managers did meet the expected return, was that expectation appropriate.

The boards must use this data to answer the question "Why did our portfolio act in this manner during this period?" before taking any action based on the 1985-1989 experience.

The remainder of the report provides performance data and comparative statistics for the 106 Massachusetts Retirement Systems and the Pension Reserve Investment Trust Fund. Discussions are included following each table for clarification and to assist in the evaluation of the investment data. This report also includes an analysis of the management fees paid by each system, indicating both net and gross performance and the percentage that management fees represent of a system's total assets. This analysis provides not only an evaluation of the amount of management fees paid by each system in 1989, but more significantly the impact these fees had on a system's total performance.

PERA once again wishes to thank the members and employees of the Massachusetts Contributory Retirement Boards and the investment managers, custodian banks and consultants employed by the boards for their cooperation and assistance in providing the information essential to the publication of this report. We look forward to the continued assistance of the boards and their staff in the development of future investment reporting.

The Division of Public Employee Retirement Administration  
Pension Investment Advisory Unit

Massachusetts Contributory Retirement Systems  
for Public Employees

Investment Report

1985-1989

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Massachusetts Contributory Retirement Systems  
for Public Employees

Table #1

	1989			1985-1989	
	Return	Rank		Annualized	Rank
				Return	
FALMOUTH	21.10	1	WEYMOUTH	16.29	1
WALTHAM	20.97	2	PRIM BOARD	15.25	2
BOSTON	20.36	3	TAUNTON	15.23	3
MALDEN	20.33	4	NEEDHAM	14.99	4
EVERETT	20.01	5	NORFOLK COUNTY	14.90	5
SPRINGFIELD	19.93	6	MASS PORT AUTH	14.86	6
NORTH ADAMS	19.79	7	WAKEFIELD	14.78	7
BROOKLINE	19.78	8	WELLESLEY	14.60	8
MASS PORT AUTH	19.14	9	WOBURN	14.50	9
ATTLEBORO	19.11	10	SHREWSBURY	14.22	10
LAWRENCE	19.04	11	HOLYOKE	14.20	11
MARBLEHEAD	18.96	12	MINUTEMAN REG VO	13.95	12
SWAMPSCOTT	18.93	13	STATE	13.87	13
NORTHAMPTON	18.12	14	DEDHAM	13.84	14
FALL RIVER	18.03	15	BOSTON	13.75	15
PRIM BOARD	17.90	16	HAVERHILL	13.65	16
WELLESLEY	17.64	17	BRAINTREE	13.63	17
LYNN	17.50	18	STATE TEACHERS	13.58	18
CONCORD	17.24	19	MILTON	13.50	19
NATICK	17.21	20	GLOUCESTER	13.43	20
FITCHBURG	17.14	21	WALTHAM	13.38	21
BELMONT	17.03	22	NATICK	13.36	22
NORWOOD	17.01	23	MASS. TURNPIKE AU	13.32	23
NORTHBRIDGE	16.99	24	MIDDLESEX COUNTY	13.26	24
GARDNER	16.97	25	STONEHAM	13.20	25
MILFORD	16.95	26	SWAMPSCOTT	13.12	26
READING	16.91	27	EASTHAMPTON	13.09	27

\* Funds became active in 1986

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #1

	1989			1985-1989 Annualized	
	Return	Rank		Return	Rank
MINUTEMAN REG VO	16.90	28	MELROSE	13.08	28
MILTON	16.88	29	FALL RIVER	13.07	29
SHREWSBURY	16.87	30	GARDNER	13.04	30
WESTFIELD	16.86	31	ARLINGTON	13.02	31
MASS. HOUSING FIN	16.84	32	ANDOVER	12.96	32
NEEDHAM	16.84	33	FAIRHAVEN	12.90	33
TAUNTON	16.83	34	ESSEX COUNTY	12.88	34
WEYMOUTH	16.69	35	PLYMOUTH	12.86	35
NORFOLK COUNTY	16.62	36	PEABODY	12.69	36
FAIRHAVEN	16.59	37	NORTHBRIDGE	12.65	37
WINTHROP	16.58	38	HINGHAM	12.60	38
SAUGUS	16.55	39	FALMOUTH	12.59	39
EASTHAMPTON	16.51	40	WORCESTER	12.53	40
WEST SPRINGFIELD	16.51	41	EVERETT	12.48	41
DEDHAM	16.43	42	HAMPDEN COUNTY	12.47	42
MONTAGUE	16.39	43	WINCHESTER	12.42	43
MIDDLESEX COUNTY	16.33	44	WORCESTER COUNTY	12.36	44
MELROSE	16.27	45	CAMBRIDGE	12.36	45
PLYMOUTH	16.18	46	PLYMOUTH COUNTY	12.35	46
STONEHAM	16.13	47	LEXINGTON	12.33	47
WAKEFIELD	16.04	48	LYNN	12.28	48
NEWTON	16.02	49	READING	12.27	49
NORTH ATTLEBORO	15.93	50	SPRINGFIELD	12.23	50
ARLINGTON	15.81	51	NORWOOD	12.18	51
WINCHESTER	15.75	52	NEWTON	12.16	52
STATE	15.70	53	MEDFORD	12.13	53
STATE TEACHERS	15.64	54	WESTFIELD	12.10	54

\* Funds became active in 1986



Massachusetts Contributory Retirement Systems  
for Public Employees

Table #1

	1989			1985-1989 Annualized	
	Return	Rank		Return	Rank
BLUE HILLS REG VO	15.39	55	ATTLEBORO	12.05	55
GREENFIELD	15.28	56	SAUGUS	11.92	56
BRISTOL COUNTY	15.18	57	MALDEN	11.83	57
PITTSFIELD	15.12	58	WINTHROP	11.71	58
HAMPDEN COUNTY	15.12	59	NORTH ADAMS	11.70	59
CHELSEA	14.75	60	PITTSFIELD	11.67	60
MEDFORD	14.70	61	CHELSEA	11.66	61
HINGHAM	14.69	62	CONCORD	11.66	62
*MASS WATER RESOUR	14.60	63	MARLBOROUGH	11.61	63
WORCESTER	14.39	64	FRAMINGHAM	11.59	64
HAMPSHIRE COUNTY	14.16	65	WATERTOWN	11.59	65
ATHOL	14.09	66	ADAMS	11.54	66
MARLBOROUGH	14.08	67	BROOKLINE	11.52	67
DANVERS	14.05	68	LEOMINSTER	11.51	68
MASS. TURNPIKE AU	14.03	69	LOWELL	11.39	69
AMESBURY	14.00	70	MONTAGUE	11.38	70
LEOMINSTER	13.93	71	BELMONT	11.35	71
BRAINTREE	13.84	72	SOMERVILLE	11.34	72
NEWBURYPORT	13.61	73	SALEM	11.30	73
FRAMINGHAM	13.53	74	LAWRENCE	11.25	74
LEXINGTON	13.48	75	METHUEN	11.19	75
QUINCY	13.43	76	FITCHBURG	11.18	76
PEABODY	13.43	77	ATHOL	11.18	77
HAVERHILL	13.43	78	BERKSHIRE COUNTY	11.14	78
ANDOVER	13.26	79	NORTH ATTLEBORO	11.11	79
GLOUCESTER	13.23	80	HAMPSHIRE COUNTY	11.05	80
METHUEN	13.21	81	BROCKTON	11.04	81

\* Funds became active in 1986

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #1

	1989			1985-1989 Annualized	
	Return	Rank		Return	Rank
HOLYOKE	13.13	82	CHICOPEE	11.02	82
CHICOPEE	13.10	83	NORTHAMPTON	10.95	83
WATERTOWN	13.10	84	DANVERS	10.91	84
ESSEX COUNTY	13.07	85	WEST SPRINGFIELD	10.90	85
SOMERVILLE	13.07	86	MARBLEHEAD	10.85	86
WOBURN	13.06	87	GREENFIELD	10.70	87
SALEM	12.86	88	AMESBURY	10.63	88
PLYMOUTH COUNTY	12.83	89	BRISTOL COUNTY	10.58	89
FRANKLIN COUNTY	11.95	90	BEVERLY	10.56	90
LOWELL	11.92	91	BLUE HILLS REG VO	10.52	91
BROCKTON	11.62	92	MAYNARD	10.14	92
ADAMS	11.52	93	NEWBURYPORT	10.08	93
GREATER LAWRENCE	11.36	94	SOUTHBRIDGE	9.97	94
CAMBRIDGE	10.95	95	CLINTON	9.76	95
BERKSHIRE COUNTY	10.49	96	WEBSTER	9.65	96
WORCESTER COUNTY	10.30	97	MASS. HOUSING FIN	9.57	97
BEVERLY	10.28	98	HULL	9.54	98
NEW BEDFORD	10.07	99	DUKES COUNTY	9.47	99
HULL	9.39	100	MILFORD	9.41	100
BARNSTABLE COUNTY	9.15	101	FRANKLIN COUNTY	9.29	101
REVERE	8.79	102	*MASS WATER RESOUR	9.28	102
DUKES COUNTY	8.31	103	QUINCY	9.10	103
CLINTON	7.65	104	NEW BEDFORD	9.00	104
SOUTHBRIDGE	6.77	105	BARNSTABLE COUNTY	8.98	105
MAYNARD	5.94	106	REVERE	8.84	106
WEBSTER	5.43	107	GREATER LAWRENCE	7.19	107

\* Funds became active in 1986

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #1 Discussion

Table #1 indicates:

the 1989 rate of return of each system and the system's ranking; and

the 1985-1989 annualized rate of return of each system and the system's ranking.

Performance is evaluated by the Division of Public Employee Retirement Administration in accordance with Bank Administration Institute Standards which are those generally accepted in the investment community. Rates of returns include interest and dividends and the increase or decrease in the market value of securities. Performance has been calculated quarterly on an accrued basis. All returns are time-weighted. Returns are reported on a gross basis in Tables #1-5 except for mutual fund shares, group trust investments, limited partnership interests and guaranteed investment contracts. Shares of the PRIT Fund and MASTERS Trust are also reported net. Share values for the PRIT Fund and MASTERS Trust are reported net of expenses to the holders of the shares. See Table #6 for more information on gross and net performance. It should be noted that uninvested assets have been included in the short term returns indicated in this report.

PERA's staff reviews the accounting records of the retirement systems and enters information regarding purchases, sales, interest, dividends, receipts and disbursements into a computer using software designed to track this information. The retirement systems have had the opportunity to audit this information. PERA's report reflects all the information forwarded to this Division by September 17, 1990.

This table lists the 1989 and the 1985-1989 annualized investment performance for the 106 contributory retirement systems and the Pension Reserve Investment Trust Fund, a state sponsored investment pool. The Massachusetts Water Resources Authority Retirement System was not in existence on January 1, 1985, and 1985 investment performance is not included in this report. Annualized performance data for this system is for the four year period beginning January 1, 1986. Systems participating in the PRIT Fund have, in previous years, received an additional dividend for their investment pursuant to Chapter 32, s. 22B of the General Laws. This additional dividend was not factored into the overall performance of the PRIT Fund.

It is important in reviewing investment performance that such performance be evaluated in the context of a board's investment

objectives. It is both interesting and useful to review the relative rankings of all the retirement boards, for retirement boards should be aware of how their investment performance relates to the performance of the other contributory retirement systems in the Commonwealth. But as we stated in the introduction to this report, the true measure of successful investment performance is measured in a system's ability to meet its investment objectives. These objectives are obviously unique to each system, which differ widely in terms of member make-up and age, funding status, risk tolerance and many other considerations. It is essential that these objectives are carefully developed, for asset allocation decisions are determined based on these investment objectives, which in turn directly impact on a board's investment performance. It is in this context, the degree to which the performance meets a board's objectives, that performance must be evaluated.

The following table lists the rate of return for the standard investment indices which are used to evaluate the performance of the Massachusetts Contributory Retirement Systems:

<u>Standard of Comparison</u>	<u>1989 Return</u>	<u>1985-1989 Return</u>
All Massachusetts Contributory Retirement Systems	15.62	12.94
Composite index representing the actual asset mix of the retirement systems each year (in 1989, 45% S&P 500, 46% Shearson Lehman Gov't/Corp. Index and 9% Treasury Bill Index)	21.50	14.31
Composite index representing 30% S&P 500 and 70% Shearson Lehman Gov't/Corp. Index	19.46	14.55
Composite index representing 40% S&P 500 and 60% Shearson Lehman Gov't/Corp. Index	21.20	15.39
Composite index representing 50% S&P 500 and 50% Shearson Lehman Gov't/Corp. Index	22.95	16.24
Composite index representing 60% S&P 500 and 40% Shearson Lehman Gov't/Corp. Index	24.69	17.07

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #2

	1989		1988		1987		1986		1985	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
ADAMS	11.52	93	6.58	104	5.35	3	9.14	102	26.30	14
AMESBURY	14.00	70	10.95	41	0.23	67	10.19	89	18.62	85
ANDOVER	13.26	79	10.18	59	0.95	62	15.15	36	26.79	13
ARLINGTON	15.81	51	10.23	58	3.11	28	16.64	18	20.13	68
ATHOL	14.09	66	9.00	79	3.72	20	9.82	94	19.90	71
ATTLEBORO	19.11	10	6.92	102	2.48	34	12.91	63	19.87	73
BARNSTABLE COUNTY	9.15	101	9.14	78	-5.48	104	12.69	64	21.15	58
BELMONT	17.03	22	10.95	40	-2.90	94	9.59	97	23.88	27
BERKSHIRE COUNTY	10.49	96	9.17	77	1.83	46	13.25	57	21.92	52
BEVERLY	10.28	98	10.64	47	-0.71	77	12.97	61	20.71	62
BLUE HILLS REG VO	15.39	55	9.51	72	3.09	29	13.35	54	11.67	104
BOSTON	20.36	3	12.73	23	-3.78	97	16.12	24	25.65	17
BRAINTREE	13.84	72	10.59	51	5.18	4	16.41	21	22.88	36
BRISTOL COUNTY	15.18	57	7.70	97	-1.20	82	11.43	79	21.05	59
BROCKTON	11.62	92	8.12	89	1.63	50	12.47	67	22.38	46
BROOKLINE	19.78	8	9.81	64	0.95	60	11.78	76	16.24	97
CAMBRIDGE	10.95	95	7.91	93	-2.86	93	16.69	16	31.96	2
CHELSEA	14.75	60	9.43	74	-1.82	86	13.48	52	24.06	24
CHICOPEE	13.10	83	12.42	27	-0.18	70	10.53	87	20.23	66
CLINTON	7.65	104	7.81	95	-5.31	103	12.45	68	28.89	4
CONCORD	17.24	19	10.48	53	3.68	21	10.67	86	16.77	96
DANVERS	14.05	68	10.57	52	1.70	49	9.84	93	19.13	84
DEDHAM	16.43	42	9.98	63	3.61	22	12.67	65	27.93	8
DUKES COUNTY	8.31	103	12.01	30	-4.55	100	10.68	85	22.68	41
EASTHAMPTON	16.51	40	12.83	21	1.99	42	14.07	46	20.94	60
ESSEX COUNTY	13.07	85	11.87	32	-1.19	81	17.16	12	25.17	19
EVERETT	20.01	5	6.85	103	0.98	58	13.56	50	22.43	45

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #2

	1989		1988		1987		1986		1985	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
FAIRHAVEN	16.59	37	13.29	19	4.19	14	9.68	95	21.53	55
FALL RIVER	18.03	15	6.41	105	1.94	43	15.35	33	25.14	20
FALMOUTH	21.10	1	9.76	66	2.30	38	12.41	71	18.37	88
FITCHBURG	17.14	21	10.40	55	1.32	54	12.41	70	15.35	99
FRAMINGHAM	13.53	74	9.55	70	2.63	33	13.56	49	19.37	81
FRANKLIN COUNTY	11.95	90	9.51	73	-0.24	71	7.73	105	18.34	89
GARDNER	16.97	25	13.41	15	3.16	26	12.94	62	19.45	80
GLOUCESTER	13.23	80	13.68	7	-0.45	74	16.57	19	25.69	16
GREATER LAWRENCE	11.36	94	8.13	88	1.71	48	7.28	106	7.69	106
GREENFIELD	15.28	56	8.34	84	0.30	66	13.19	58	17.23	93
HAMPDEN COUNTY	15.12	59	11.37	35	2.03	41	13.89	47	20.78	61
HAMPSHIRE COUNTY	14.16	65	8.25	86	4.40	12	11.73	77	17.17	95
HAVERHILL	13.43	78	13.40	16	2.87	31	16.80	14	22.71	40
HINGHAM	14.69	62	10.89	43	0.95	61	15.32	34	22.28	47
HOLYOKE	13.13	82	12.85	20	4.23	13	14.15	45	27.88	9
HULL	9.39	100	9.79	65	0.57	64	11.36	80	17.28	91
LAWRENCE	19.04	11	5.44	107	-2.18	89	12.24	72	23.67	31
LEOMINSTER	13.93	71	10.03	61	2.47	35	12.21	74	19.64	77
LEXINGTON	13.48	75	9.57	69	-0.91	79	15.67	31	25.47	18
LOWELL	11.92	91	7.32	99	3.74	19	14.50	43	20.21	67
LYNN	17.50	18	11.62	34	-1.95	87	12.20	75	23.66	32
MALDEN	20.33	4	11.98	31	-2.94	95	9.38	99	22.27	48
MARBLEHEAD	18.96	12	10.61	50	-3.24	96	7.88	104	21.90	53
MARLBOROUGH	14.08	67	14.11	2	-0.71	76	9.91	90	21.89	54
MASS PORT AUTH	19.14	9	11.34	36	3.93	17	18.68	9	22.18	50
*MASS WATER RESOUR	14.60	63	10.66	46	6.32	1	5.78	107		107
MASS. HOUSING FIN	16.84	32	13.80	6	-0.90	78	9.39	98	9.58	105

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #2

	1989		1988		1987		1986		1985	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
MASS. TURNPIKE AU	14.03	69	10.78	45	3.15	27	16.90	13	22.68	42
MAYNARD	5.94	106	7.72	96	1.10	56	9.91	91	27.80	10
MEDFORD	14.70	61	10.00	62	1.41	51	15.12	37	20.35	64
MELROSE	16.27	45	10.35	56	2.11	39	16.48	20	21.15	57
METHUEN	13.21	81	8.16	87	1.87	45	13.51	51	20.03	70
MIDDLESEX COUNTY	16.33	44	11.16	39	2.06	40	14.89	39	22.92	35
MILFORD	16.95	26	8.05	91	-4.86	102	8.98	103	19.66	76
MILTON	16.88	29	13.49	12	4.46	9	10.93	82	22.53	43
MINUTEMAN REG VO	16.90	28	13.87	3	4.49	8	22.05	1	13.17	103
MONTAGUE	16.39	43	13.56	9	4.86	5	9.15	101	13.28	102
NATICK	17.21	20	10.91	42	-0.09	69	14.56	42	25.80	15
NEEDHAM	16.84	33	13.83	4	4.67	6	20.76	4	19.58	78
NEW BEDFORD	10.07	99	8.04	92	-6.31	105	13.68	48	21.48	56
NEWBURYPORT	13.61	73	10.32	57	-1.62	84	9.18	100	20.08	69
NEWTON	16.02	49	13.60	8	-3.83	98	14.33	44	22.46	44
NORFOLK COUNTY	16.62	36	13.42	14	4.14	15	17.47	11	23.77	29
NORTH ADAMS	19.79	7	9.31	75	-2.33	90	9.84	92	23.80	28
NORTH ATTLEBORO	15.93	50	9.60	68	0.57	65	12.66	66	17.64	90
NORTHAMPTON	18.12	14	11.28	37	-6.82	106	12.44	69	22.07	51
NORTHBRIDGE	16.99	24	13.50	11	3.78	18	10.34	88	19.33	82
NORWOOD	17.01	23	11.22	38	2.83	32	13.30	56	17.17	94
PEABODY	13.43	77	12.77	22	-0.41	73	15.77	29	23.23	34
PITTSFIELD	15.12	58	9.54	71	-1.81	85	13.05	60	24.07	23
PLYMOUTH	16.18	46	8.33	85	-2.04	88	15.73	30	28.32	5
PLYMOUTH COUNTY	12.83	89	10.46	54	-1.30	83	16.71	15	24.66	21
PRIM BOARD	17.90	16	13.43	13	3.25	24	19.94	7	22.76	38
QUINCY	13.43	76	6.36	106	-4.66	101	13.30	55	18.62	86

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #2

	1989		1988		1987		1986		1985	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
READING	16.91	27	11.71	33	-2.77	91	10.73	84	26.85	12
REVERE	8.79	102	9.26	76	2.40	36	9.66	96	14.44	101
SALEM	12.86	88	7.39	98	2.99	30	14.57	41	19.46	79
SAUGUS	16.55	39	13.50	10	3.98	16	11.50	78	14.53	100
SHREWSBURY	16.87	30	13.81	5	4.42	11	19.33	8	17.28	92
SOMERVILLE	13.07	86	10.79	44	-7.08	107	13.14	59	29.94	3
SOUTHBRIDGE	6.77	105	7.82	94	-2.85	92	16.06	25	23.91	26
SPRINGFIELD	19.93	6	8.54	83	-1.18	80	14.91	38	20.45	63
STATE	15.70	53	12.67	24	1.89	44	16.17	23	24.10	22
STATE TEACHERS	15.64	54	12.54	25	0.96	59	16.03	27	24.01	25
STONEHAM	16.13	47	8.63	80	2.37	37	16.38	22	23.69	30
SWAMPSCOTT	18.93	13	14.25	1	-3.90	99	10.87	83	27.94	7
TAUNTON	16.83	34	10.64	48	6.06	2	20.07	5	23.41	33
WAKEFIELD	16.04	48	13.34	17	4.43	10	21.13	3	19.76	74
WALTHAM	20.97	2	7.18	100	1.40	52	16.65	17	22.20	49
WATERTOWN	13.10	84	12.25	28	1.29	55	12.23	73	19.89	72
WEBSTER	5.43	107	7.10	101	3.36	23	13.46	53	19.71	75
WELLESLEY	17.64	17	12.46	26	3.23	25	17.91	10	22.73	39
WEST SPRINGFIELD	16.51	41	10.63	49	1.07	57	11.20	81	15.79	98
WESTFIELD	16.86	31	8.11	90	0.77	63	15.59	32	20.29	65
WEYMOUTH	16.69	35	13.33	18	4.53	7	20.02	6	28.19	6
WINCHESTER	15.75	52	9.62	67	0.01	68	15.27	35	22.77	37
WINTHROP	16.58	38	10.05	60	-0.24	72	14.67	40	18.51	87
WOBURN	13.06	87	8.56	82	-0.50	75	21.69	2	32.44	1
WORCESTER	14.39	64	12.22	29	1.78	47	15.81	28	19.25	83
WORCESTER COUNTY	10.30	97	8.59	81	1.40	53	16.05	26	27.06	11

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.



Massachusetts Contributory Retirement Systems  
for Public Employees

Table #2 Discussion

Table #2 indicates:

the 1989 rate of return of each system and the system's ranking;

the 1988 rate of return of each system and the system's ranking;

the 1987 rate of return of each system and the system's ranking;

the 1986 rate of return of each system and the system's ranking; and

the 1985 rate of return of each system and the system's ranking.

This table indicates the rate of return of each system for each of the past five years. Investment performance over each of these years must be reviewed relative to a board's investment objectives over this period. A board should review whether its objectives have changed during this period, with special consideration paid to asset allocation or management changes. The question retirement boards should ask is the degree to which performance each year was impacted by changes made by the retirement board or by general economic conditions. This evaluation can be used to assist each board in evaluating its current investment objectives, and consider whether it is appropriate to revise any of these objectives.

The following table lists the rate of return for the standard investment indices which are used to evaluate the performance of the Massachusetts Contributory Retirement Systems:

<u>Standard of Comparison</u>	<u>1989 Return</u>	<u>1988 Return</u>	<u>1987 Return</u>	<u>1986 Return</u>	<u>1985 Return</u>
All Massachusetts Contributory Retirement Systems	15.62	11.52	.71	15.64	22.35
Composite index representing the actual asset mix of the retirement systems each year (in 1989, 45% S&P 500, 46% Shearson Lehman Gov't/Corp. Index and 9% Treasury Bill Index)	21.50	11.33	3.83	15.69	20.15

<u>Standard of Comparison</u>	<u>1989 Return</u>	<u>1988 Return</u>	<u>1987 Return</u>	<u>1986 Return</u>	<u>1985 Return</u>
Composite index representing 30% S&P 500 and 70% Shearson Lehman Gov't/Corp. Index	19.46	10.29	3.17	16.55	24.52
Composite index representing 40% S&P 500 and 60% Shearson Lehman Gov't/Corp. Index	21.20	11.19	3.46	16.86	25.58
Composite index representing 50% S&P 500 and 50% Shearson Lehman Gov't/Corp. Index	22.95	12.11	3.75	17.18	26.65
Composite index representing 60% S&P 500 and 40% Shearson Lehman Gov't/Corp. Index	24.69	13.01	4.04	17.49	27.70

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #3

	1989 Equity				1989 Fixed Income				1989 Short Term			
	Return	Rank	Alloc	Rank	Return	Rank	Alloc	Rank	Return	Rank	Alloc	Rank
ADAMS	18.16	58	22.51	91	11.96	70	49.88	58	9.05	67	27.61	12
AMESBURY	23.22	41	26.59	81	12.34	58	67.36	12	11.71	1	6.05	79
ANDOVER	26.21	32	29.28	71	13.43	33	62.38	19	8.87	75	8.34	63
ARLINGTON	27.90	21	24.61	86	12.22	63	65.19	15	9.58	35	10.21	53
ATHOL	31.98	12	21.29	93	10.77	88	57.66	35	9.59	34	21.04	24
ATTLEBORO	34.65	5	30.84	68	13.92	21	55.50	39	8.77	78	13.66	41
BARNSTABLE COUNTY	8.11	97	51.92	25	10.95	86	17.10	87	9.47	43	30.98	6
BELMONT	36.50	2	34.16	58	10.89	87	46.60	66	8.69	81	19.24	28
BERKSHIRE COUNTY	7.72	98	11.03	105	12.03	67	38.30	76	9.66	28	50.67	3
BEVERLY	9.25	95	39.55	39	12.11	65	34.94	79	9.01	69	25.51	16
BLUE HILLS REG VO	23.40	40	24.13	88	13.71	27	66.21	13	8.71	79	9.66	55
BOSTON	26.94	25	51.47	26	16.07	1	27.64	83	9.93	13	20.89	25
BRAINTREE	16.64	83	17.77	97	13.85	23	61.14	22	9.83	16	21.08	23
BRISTOL COUNTY	19.48	51	37.73	47	13.96	20	44.01	69	10.60	4	18.25	31
BROCKTON	10.55	93	34.90	56	14.18	11	51.41	53	9.17	61	13.70	40
BROOKLINE	32.98	11	39.52	40	14.01	16	55.46	40	8.64	83	5.02	86
CAMBRIDGE	10.42	94	44.24	33	13.78	25	33.03	80	5.52	107	22.73	19
CHELSEA	23.16	42	29.15	72	12.99	44	59.60	25	7.72	96	11.25	48
CHICOPEE	16.08	86	31.35	65	10.61	90	54.39	47	9.04	68	14.26	38
CLINTON	5.06	100	79.30	18	12.72	51	3.64	90	8.81	77	17.07	34
CONCORD	28.34	17	30.85	67	13.47	32	55.75	37	9.60	32	13.40	42
DANVERS	23.85	39	26.97	80	12.28	61	72.50	7	9.57	37	0.53	106
DEDHAM	16.74	81	98.77	4		91	0.00	101	9.23	58	1.23	102
DUKES COUNTY	6.74	99	43.77	34	11.25	83	27.23	84	8.52	86	29.00	10
EASTHAMPTON	33.78	9	14.50	100	14.69	4	78.09	3	9.50	41	7.41	70
ESSEX COUNTY	18.38	56	34.96	55	10.71	89	47.01	65	7.24	100	18.03	32
EVERETT	34.86	4	33.97	60	14.10	15	55.02	44	9.46	45	11.01	52

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #3

	1989 Equity				1989 Fixed Income				1989 Short Term			
	Return	Rank	Alloc	Rank	Return	Rank	Alloc	Rank	Return	Rank	Alloc	Rank
FAIRHAVEN	17.05	66	90.52	15		92	0.00	107	6.86	104	9.48	56
FALL RIVER	36.70	1	25.32	85	13.98	18	63.61	18	9.47	44	11.07	50
FALMOUTH	34.40	6	39.40	41	14.42	7	54.59	46	9.68	26	6.01	80
FITCHBURG	24.84	35	27.64	76	14.10	14	54.98	45	10.04	7	17.39	33
FRAMINGHAM	17.03	68	32.86	61	12.25	62	58.26	32	9.17	62	8.88	58
FRANKLIN COUNTY	18.44	55	26.48	82	11.19	84	65.92	14	6.25	106	7.60	69
GARDNER	16.99	71	88.28	16		93	0.00	94	9.14	63	11.72	46
GLOUCESTER	16.71	82	38.34	46	11.15	85	57.77	34	7.19	101	3.89	91
GREATER LAWRENCE	16.82	77	23.08	90	13.05	43	50.39	56	7.17	102	26.54	13
GREENFIELD	22.77	45	34.07	59	12.29	59	37.26	77	10.03	8	28.67	11
HAMPDEN COUNTY	22.04	47	24.39	87	12.68	52	69.05	9	9.60	33	6.56	73
HAMPSHIRE COUNTY	26.84	27	14.34	101	13.10	40	55.27	42	9.94	12	30.39	7
HAVERHILL	17.54	62	28.54	74	11.83	74	58.96	28	8.61	84	12.50	44
HINGHAM	22.98	43	26.99	79	12.46	56	64.49	16	8.10	93	8.52	59
HOLYOKE	16.23	85	38.86	43	11.30	82	58.68	30	8.27	90	2.47	96
HULL	-2.74	104	14.27	102	12.28	60	55.95	36	9.92	14	29.78	8
LAWRENCE	27.05	24	40.42	37	14.36	9	58.14	33	8.45	88	1.44	101
LEOMINSTER	18.58	54	21.43	92	13.78	26	48.90	60	8.97	72	29.67	9
LEXINGTON	15.52	89	48.09	28	15.00	2	44.00	70	7.92	95	7.92	65
LOWELL	14.13	91	29.92	70	12.75	50	44.76	68	9.82	17	25.32	17
LYNN	26.86	26	44.65	32	11.96	69	42.00	73	9.31	52	13.35	43
MALDEN	31.29	13	56.43	22	12.19	64	40.19	75	9.57	36	3.38	94
MARBLEHEAD	27.51	22	53.50	23	11.51	77	40.84	74	9.86	15	5.66	81
MARLBOROUGH	19.51	50	36.40	50	11.50	78	61.98	20	9.05	66	1.62	99
MASS PORT AUTH	29.50	15	37.28	48	12.98	46	55.39	41	9.75	20	7.33	72
*MASS WATER RESOUR	23.93	38	32.66	63	11.99	68	51.32	54	9.18	59	16.02	36
MASS. HOUSING FIN	16.83	78	98.26	5		94	0.00	96	8.98	70	1.74	98

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #3

	1989 Equity				1989 Fixed Income				1989 Short Term			
	Return	Rank	Alloc	Rank	Return	Rank	Alloc	Rank	Return	Rank	Alloc	Rank
MASS. TURNPIKE AU	13.14	92	1.80	107	14.62	5	82.95	2	9.94	11	15.25	37
MAYNARD	1.23	102	53.15	24	13.22	37	9.60	89	9.62	31	37.25	4
MEDFORD	26.67	28	14.63	99	13.88	22	58.98	27	7.94	94	26.39	14
MELROSE	30.65	14	24.00	89	13.38	34	52.11	52	9.33	49	23.89	18
METHUEN	17.78	60	35.28	54	11.92	71	48.13	61	8.83	76	16.59	35
MIDDLESEX COUNTY	26.66	29	31.43	64	13.17	38	48.06	62	9.18	60	20.51	26
MILFORD	24.40	37	38.91	42	13.59	30	53.36	49	10.19	5	7.73	67
MILTON	17.05	67	94.52	11		95	0.00	98	7.35	99	5.48	83
MINUTEMAN REG VO	16.92	75	98.96	3		96	0.00	97	8.66	82	1.04	104
MONTAGUE	16.93	74	96.55	8		97	0.00	92	7.42	98	3.45	93
NATICK	28.26	19	41.27	35	12.07	66	49.56	59	8.15	92	9.17	57
NEEDHAM	16.94	73	93.60	13		98	0.00	91	8.41	89	6.40	75
NEW BEDFORD	8.23	96	56.58	21	13.26	36	23.36	85	9.63	29	20.05	27
NEWBURYPORT	25.89	33	26.28	83	11.83	73	68.39	10	10.04	6	5.33	84
NEWTON	20.93	49	40.64	36	12.93	48	55.60	38	10.88	3	3.76	92
NORFOLK COUNTY	16.81	79	95.24	10		99	0.00	93	9.29	56	4.76	88
NORTH ADAMS	33.97	7	40.06	38	12.53	54	52.19	51	9.45	47	7.76	66
NORTH ATTLEBORO	17.67	61	28.95	73	14.41	8	70.00	8	9.68	24	1.05	103
NORTHAMPTON	26.24	30	47.79	29	13.10	41	42.29	72	9.98	9	9.92	54
NORTHBRIDGE	17.02	70	99.78	1		100	0.00	95	9.32	50	0.22	107
NORWOOD	27.23	23	20.46	94	12.38	57	53.75	48	8.55	85	25.79	15
PEABODY	17.23	64	38.49	45	11.49	79	55.20	43	6.38	105	6.31	77
PITTSFIELD	24.71	36	35.84	53	12.60	53	53.09	50	9.72	21	11.07	51
PLYMOUTH	33.07	10	19.08	95	14.57	6	72.55	6	9.54	39	8.38	61
PLYMOUTH COUNTY	3.16	101	12.11	104	13.98	19	86.40	1	9.63	30	1.50	100
PRIM BOARD	21.99	48	63.72	20	11.55	76	31.22	82	11.61	2	5.06	85
QUINCY	18.93	53	35.93	52	11.34	81	42.44	71	9.71	23	21.63	22

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #3

	1989 Equity				1989 Fixed Income				1989 Short Term			
	Return	Rank	Alloc	Rank	Return	Rank	Alloc	Rank	Return	Rank	Alloc	Rank
READING	16.90	76	93.78	12		101	0.00	106	9.56	38	6.22	78
REVERE	-1.31	103	14.68	98	14.10	13	32.83	81	8.69	80	52.49	1
SALEM	16.76	80	31.03	66	12.48	55	60.92	23	9.06	65	8.05	64
SAUGUS	17.03	69	81.06	17		102	0.00	102	7.15	103	18.94	30
SHREWSBURY	17.08	65	95.46	9		103	0.00	100	8.90	74	4.54	89
SOMERVILLE	14.74	90	67.08	19	11.49	80	10.49	88	9.71	22	22.43	20
SOUTHBRIDGE	-33.47	107	6.65	106	13.81	24	59.05	26	8.51	87	34.30	5
SPRINGFIELD	36.37	3	34.60	57	14.12	12	60.51	24	9.43	48	4.90	87
STATE	15.89	87	99.07	2		104	0.00	103	9.30	53	0.93	105
STATE TEACHERS	15.87	88	91.54	14		105	0.00	104	9.30	54	8.46	60
STONEHAM	22.93	44	32.83	62	13.37	35	58.83	29	9.80	18	8.35	62
SWAMPSCOTT	28.60	16	48.66	27	12.98	45	44.79	67	9.27	57	6.55	74
TAUNTON	26.22	31	27.46	77	13.68	28	61.20	21	8.22	91	11.34	47
WAKEFIELD	16.49	84	98.11	6		106	0.00	105	7.50	97	1.89	97
WALTHAM	33.86	8	38.53	44	13.99	17	50.25	57	9.77	19	11.22	49
WATERTOWN	17.39	63	36.03	51	11.63	75	58.40	31	9.49	42	5.57	82
WEBSTER	-5.40	106	27.04	78	13.13	39	21.50	86	9.31	51	51.46	2
WELLESLEY	22.39	46	45.59	30	13.48	31	47.08	64	9.06	64	7.33	71
WEST SPRINGFIELD	28.13	20	26.05	84	12.96	47	67.55	11	9.96	10	6.40	76
WESTFIELD	28.29	18	29.95	69	13.09	42	47.91	63	9.29	55	22.15	21
WEYMOUTH	16.98	72	97.16	7		107	0.00	99	8.97	71	2.84	95
WINCHESTER	17.87	59	37.00	49	14.86	3	50.72	55	9.68	25	12.28	45
WINTHROP	25.71	34	27.91	75	13.59	29	64.43	17	9.67	27	7.66	68
WOBURN	19.47	52	13.10	103	12.87	49	73.12	5	8.95	73	13.77	39
WORCESTER	18.34	57	44.66	31	11.84	72	36.37	78	9.45	46	18.97	29
WORCESTER COUNTY	-4.14	105	18.43	96	14.24	10	77.52	4	9.51	40	4.05	90

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #3 Discussion

Table #3 indicates:

the 1989 equity rate of return of each system and the system's ranking;

the December 31, 1989 equity allocation of each system and the ranking of this allocation;

the 1989 fixed income rate of return of each system and the system's ranking;

the December 31, 1989 fixed income allocation of each system and the ranking of this allocation;

the 1989 short term rate of return of each system and the system's ranking; and

the December 31, 1989 short term allocation of each system and the ranking of this allocation.

This table allows an evaluation of the performance and ranking of each asset class. Returns should be evaluated both in terms of their relative ranking with other systems and also relative to the financial markets as evidenced by market index returns. Within each asset class a board should consider the degree to which individual asset class objectives are being met, and whether the board employed the appropriate investment strategy to meet these objectives. Investment returns within each asset class are influenced by a number of factors, including the strategy employed by a system's investment manager, turnover in the portfolio, and restructuring of the portfolio by re-allocating assets or retaining new or additional managers.

This table also provides information on the asset allocations of each of the systems. In reviewing asset allocations, a board should consider whether allocations among the different asset classes in 1989 were appropriate in meeting overall investment objectives. The information provided in this table is directly linked to the total returns listed in Table 1, because the allocation of assets is a key determinant of total investment return. A system may perform well within a particular asset class yet lag other systems in total return due to the allocation of assets.

Retirement systems that continue to invest pursuant to Chapter 32 and statutory restrictions are authorized to invest as follows provided all securities appear on the "legal list":

in fixed income obligations of the U.S Government and its agencies;

up to 20% in fixed income obligations of railroad companies;

up to 35% in fixed income obligations of telephone companies;

up to 50% in fixed income obligations of public service companies;

up to 15% in miscellaneous fixed income obligations;

up to 25% in equities of banks and insurance companies; and

in deposit accounts at Massachusetts chartered and federally chartered institutions.

Retirement systems which have been authorized by PERA to invest without being subject to the "legal list" restrictions invest pursuant to the following guidelines set by PERA:

up to 40% in equity investments:

75% of equity investments must be in companies with \$100 million in outstanding equity; not more than 5% of equity investments may be in any one company; equities must be traded on a U.S. stock exchange or over the counter; turnover of the equity portfolio is limited to 50% per year; real estate investments are included within the 40% committed to equities and may not exceed 5%; and venture capital is included within the 40% committed to equities and is limited to between 3% and 5%

between 40% and 80% allocated to fixed income investments:

fixed income investments must have a minimum quality rating of BAA; 75% of fixed income investments must be rated A or better; no more than 5% may be invested in the fixed income securities of one company; investments shall only be made in issues with an outstanding par of \$50 million at the time of purchase; and turnover of fixed income investments is limited to 100%

up to 40% in cash and short term investments:

in money market funds; commercial paper; certificates of deposit; and repurchase agreements.

PERA regulations authorize retirement systems to invest pursuant to supplementary regulations which authorize investments other than those outlined here.



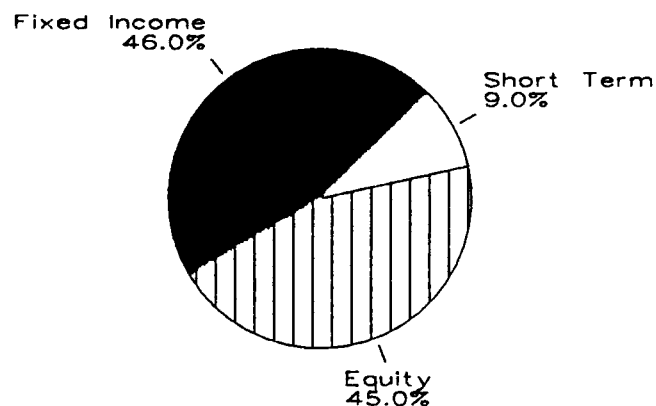
Systems that have joined the PRIT Fund hold shares of the PRIT fund which are considered equities and short term investments authorized under statutory restrictions. To review the performance of each asset class for these systems, review the performance of each asset class of the PRIT Fund. To see the asset allocation of these systems, review the asset allocation of the PRIT Fund. The State Employees' Retirement System and the Teachers' Retirement System hold shares of the MASTERS Trust and the PRIT Fund which are both considered equities.

The following table lists the rate of return for the standard investment indices which are used to evaluate the performance of the Massachusetts Contributory Retirement Systems:

<u>Standard of Comparison</u>	<u>Equity Return</u>	<u>Fixed Income Return</u>	<u>Short Term Return</u>
All Massachusetts Contributory Retirement Systems (excluding State Employees' and Teachers')	22.41	12.80	10.39
S&P 500 Stock Index	31.68		
Europe, Australia, Far East (EAFE) Index	10.50		
Shearson Lehman Gov't/Corp. Bond Index		14.23	
Treasury Bill Index			8.40

The Massachusetts Contributory Retirement Systems invested 46% in fixed income securities, 45% in equity securities and 9% in short term investments as of December 31, 1989. This asset allocation was virtually unchanged from last year.

### Asset Allocation December 31, 1989



Massachusetts Contributory Retirement Systems  
for Public Employees

Table #4

	1985-1989 Annualized		1985-1989 Equity Annualized		1985-1989 Fixed Income Annualized		1985-1989 Short Term Annualized	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank
ADAMS	11.54	66	4.67	106	12.86	30	7.15	90
AMESBURY	10.63	88	20.68	17	11.12	77	7.57	77
ANDOVER	12.96	32	12.64	88	13.66	14	7.55	78
ARLINGTON	13.02	31	18.54	46	11.54	69	8.37	32
ATHOL	11.18	77	24.23	6	9.93	94	8.44	28
ATTLEBORO	12.05	55	21.29	15	10.50	92	7.24	86
BARNSTABLE COUNTY	8.98	105	9.92	101	8.53	102	8.52	25
BELMONT	11.35	71	15.30	66	11.73	65	8.41	31
BERKSHIRE COUNTY	11.14	78	15.17	69	12.59	37	8.33	36
BEVERLY	10.56	90	14.19	74	12.44	43	8.13	44
BLUE HILLS REG VO	10.52	91	17.84	50	9.51	98	7.02	94
BOSTON	13.75	15	18.68	42	13.06	22	8.16	42
BRAINTREE	13.63	17	18.83	40	12.97	25	7.83	60
BRISTOL COUNTY	10.58	89	12.54	89	11.29	72	8.70	19
BROCKTON	11.04	81	13.63	84	12.43	45	6.94	97
BROOKLINE	11.52	67	29.32	1	10.95	82	8.06	48
CAMBRIDGE	12.36	45	13.52	86	12.79	32	7.17	89
CHELSEA	11.66	61	15.32	65	11.90	61	5.96	105
CHICOPEE	11.02	82	19.64	28	10.58	89	8.97	12
CLINTON	9.76	95	11.18	96	12.20	52	7.48	80
CONCORD	11.66	62	13.55	85	11.85	63	7.53	79
DANVERS	10.91	84	19.08	35	10.70	87	7.83	61
DEDHAM	13.84	14	16.60	59	13.03	23	5.55	106
DUKES COUNTY	9.47	99	12.34	90	9.53	97	8.95	14
EASTHAMPTON	13.09	27	23.11	7	13.45	17	8.98	11
ESSEX COUNTY	12.88	34	20.61	19	12.44	44	7.89	55
EVERETT	12.48	41	19.81	25	11.10	78	8.36	33

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #4

	1985-1989 Annualized		1985-1989 Equity Annualized		1985-1989 Fixed Income Annualized		1985-1989 Short Term Annualized	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank
FAIRHAVEN	12.90	33	18.29	47	10.53	91	6.31	104
FALL RIVER	13.07	29	20.42	20	12.60	36	9.02	10
FALMOUTH	12.59	39	13.73	81	12.26	50	8.17	41
FITCHBURG	11.18	76	17.03	55	13.58	15	8.96	13
FRAMINGHAM	11.59	64	18.67	44	11.29	73	8.69	21
FRANKLIN COUNTY	9.29	101	8.28	103	11.22	74	6.61	103
GARDNER	13.04	30	13.89	80	21.83	6	8.93	15
GLOUCESTER	13.43	20	21.49	14	11.97	59	8.15	43
GREATER LAWRENCE	7.19	107	7.72	104	7.18	103	7.24	85
GREENFIELD	10.70	87	14.72	73	10.78	85	7.60	73
HAMPDEN COUNTY	12.47	42	28.18	2	10.95	81	8.19	40
HAMPSHIRE COUNTY	11.05	80	26.96	3	11.21	75	8.54	23
HAVERHILL	13.65	16	21.88	12	13.88	13	7.34	82
HINGHAM	12.60	38	19.02	37	12.31	48	8.01	51
HOLYOKE	14.20	11	26.81	4	11.98	58	7.69	70
HULL	9.54	98	11.36	95	12.13	53	8.71	18
LAWRENCE	11.25	74	5.90	105	12.61	35	7.18	88
LEOMINSTER	11.51	68	19.08	36	13.23	19	8.09	46
LEXINGTON	12.33	47	19.16	33	12.55	41	7.88	56
LOWELL	11.39	69	19.74	26	12.40	46	7.70	69
LYNN	12.28	48	15.18	68	12.35	47	8.33	35
MALDEN	11.83	57	15.48	64	12.07	57	7.80	63
MARBLEHEAD	10.85	86	15.55	63	11.10	79	9.63	3
MARLBOROUGH	11.61	63	17.69	51	9.32	100	7.19	87
MASS PORT AUTH	14.86	6	19.72	27	12.81	31	8.41	30
*MASS WATER RESOUR	9.28	102	21.62	13	9.35	99	7.13	91
MASS. HOUSING FIN	9.57	97	11.01	97	12.55	40	8.04	50

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #4

	1985-1989 Annualized		1985-1989 Equity Annualized		1985-1989 Fixed Income Annualized		1985-1989 Short Term Annualized	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank
MASS. TURNPIKE AU	13.32	23	9.93	100	15.14	10	7.95	54
MAYNARD	10.14	92	11.36	94	10.65	88	8.53	24
MEDFORD	12.13	53	19.19	32	11.88	62	7.78	66
MELROSE	13.08	28	20.68	18	12.62	34	8.49	26
METHUEN	11.19	75	17.29	54	11.03	80	6.86	99
MIDDLESEX COUNTY	13.26	24	18.96	38	12.55	39	9.29	7
MILFORD	9.41	100	13.70	82	9.57	96	8.06	49
MILTON	13.50	19	25.75	5	21.73	7	6.80	101
MINUTEMAN REG VO	13.95	12	14.03	77		104	8.13	45
MONTAGUE	11.38	70	18.57	45	19.06	8	7.47	81
NATICK	13.36	22	23.04	8	11.20	76	7.58	76
NEEDHAM	14.99	4	17.52	53	37.34	2	8.48	27
NEW BEDFORD	9.00	104	8.46	102	10.71	86	7.99	53
NEWBURYPORT	10.08	93	18.75	41	11.60	68	7.79	64
NEWTON	12.16	52	16.77	57	12.22	51	8.35	34
NORFOLK COUNTY	14.90	5	20.02	21	22.74	5	7.86	57
NORTH ADAMS	11.70	59	16.57	60	12.29	49	9.12	8
NORTH ATTLEBORO	11.11	79	14.14	75	10.87	84	7.99	52
NORTHAMPTON	10.95	83	14.79	72	10.92	83	10.66	1
NORTHBRIDGE	12.65	37	14.10	76	16.75	9	8.43	29
NORWOOD	12.18	51	18.08	49	11.62	67	7.68	71
PEABODY	12.69	36	21.92	11	11.50	70	6.99	95
PITTSFIELD	11.67	60	18.96	39	12.48	42	8.33	37
PLYMOUTH	12.86	35	15.92	62	13.36	18	3.52	107
PLYMOUTH COUNTY	12.35	46	13.28	87	12.89	28	8.70	20
PRIM BOARD	15.25	2	18.23	48	12.94	27	9.42	5
QUINCY	9.10	103	16.63	58	9.23	101	8.55	22

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #4

	1985-1989 Annualized		1985-1989 Equity Annualized		1985-1989 Fixed Income Annualized		1985-1989 Short Term Annualized	
	Return	Rank	Return	Rank	Return	Rank	Return	Rank
READING	12.27	49	13.96	78	12.68	33	8.76	17
REVERE	8.84	106	11.85	92	12.96	26	7.84	58
SALEM	11.30	73	15.21	67	12.87	29	7.79	65
SAUGUS	11.92	56	10.45	98	42.57	1	7.06	92
SHREWSBURY	14.22	10	16.57	61	32.33	4	7.81	62
SOMERVILLE	11.34	72	20.97	16	9.64	95	8.27	38
SOUTHBRIDGE	9.97	94	3.20	107	12.58	38	6.82	100
SPRINGFIELD	12.23	50	22.34	10	11.71	66	7.30	83
STATE	13.87	13	13.94	79		105	6.93	98
STATE TEACHERS	13.58	18	13.64	83		106	6.70	102
STONEHAM	13.20	25	19.82	24	12.97	24	7.83	59
SWAMPSCOTT	13.12	26	18.67	43	11.90	60	9.43	4
TAUNTON	15.23	3	22.79	9	13.22	20	7.70	68
WAKEFIELD	14.78	7	16.87	56	35.53	3	7.63	72
WALTHAM	13.38	21	19.62	29	11.80	64	9.12	9
WATERTOWN	11.59	65	19.13	34	10.04	93	7.60	74
WEBSTER	9.65	96	10.35	99	11.41	71	8.07	47
WELLESLEY	14.60	8	14.98	71	14.19	11	9.67	2
WEST SPRINGFIELD	10.90	85	11.45	93	10.55	90	9.40	6
WESTFIELD	12.10	54	19.91	23	12.10	56	7.58	75
WEYMOUTH	16.29	1	17.60	52		107	6.96	96
WINCHESTER	12.42	43	19.91	22	13.47	16	7.77	67
WINTHROP	11.71	58	15.04	70	12.11	55	7.25	84
WOBURN	14.50	9	19.50	30	14.14	12	7.04	93
WORCESTER	12.53	40	19.35	31	12.11	54	8.19	39
WORCESTER COUNTY	12.36	44	12.30	91	13.19	21	8.91	16

\* Funds became active in 1986

NOTE: A blank return signifies that the asset class was not active during the period.

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #4 Discussion

Table #4 indicates:

the 1985-1989 annualized rate of return of each system and the system's ranking;

the 1985-1989 annualized equity rate of return of each system and the system's ranking;

the 1985-1989 annualized fixed income rate of return of each system and the system's ranking; and

the 1985-1989 annualized short term rate of return of each system and the system's ranking (for State Employees' and Teachers' the 1986-1989 annualized short term rate of return is indicated).

PERA has, in the past, emphasized that performance must be evaluated over long periods of time. Sufficient data is now available for each board to fully evaluate the performance of the retirement system.

This table enables an analysis of individual asset class return over the five year period 1985-1989. Returns should be evaluated relative to appropriate market indices to determine how well a system performed during this period. Similar questions raised in the review of the 1989 asset returns in Table 3 can also be applied to the five year returns, for many of the same factors bear on a system's return. Strategy, turnover, and restructuring during the period will impact the returns, and a board should assess whether objectives were met within each asset class. Based on this evaluation, a board should consider whether adjustments are appropriate to investment objectives or to the strategies or allocations employed by the board.

Systems participating in the PRIT Fund hold shares of the PRIT Fund which are considered equities. To see the performance of each asset class for these systems, see the performance of the PRIT Fund. The performance of these systems prior to joining the PRIT Fund is reflected in this table.

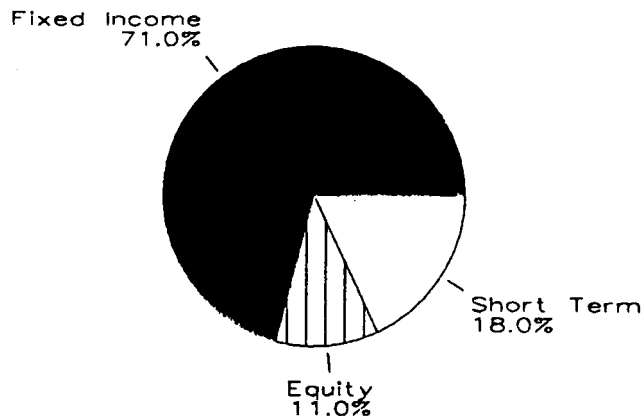
The State Employees' Retirement System and the Teachers' Retirement System hold shares of the MASTERS Trust and the PRIT Fund which are both considered equities.

The following table lists the rate of return for the standard investment indices on an annualized basis for the 1985-1989 period which are used to evaluate the performance of the Massachusetts Contributory Retirement Systems:

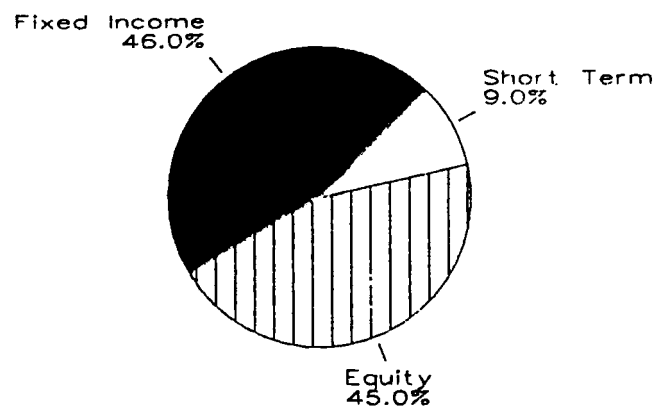
<u>Standard of Comparison</u>	<u>Annualized Equity Return</u>	<u>Annualized Fixed Income Return</u>	<u>Annualized Short Term Return</u>
All Massachusetts Contributory Retirement Systems (excluding State Employees' and Teachers')	18.79	12.00	8.10
S&P 500 Stock Index	20.28		
Europe, Australia, Far East (EAFE) Index	36.13		
Shearson Lehman Gov't/Corp. Bond Index		12.01	
Treasury Bill Index			7.03

During the four year period, 1986-1989 retirement boards significantly redeployed assets into different asset classes. In this period, fixed income assets were reduced from 71% to 46%. Equity investments were increased from 11% to 45%. Short term investments were decreased from 18% to 9%. This is a result of the decisions of the boards to hire investment managers and have the assets of the Contributory Retirement Systems managed according to the prudent person standards.

Asset Allocation  
December 31, 1985



Asset Allocation  
December 31, 1989



Massachusetts Contributory Retirement Systems  
for Public Employees

Table #5

	1985-1989 Cumulative Return    Rank		1984 Market Value       Rank		1989 Market Value       Rank		1985-1989 Percent Change      Rank	
ADAMS	72.62	66	1,969,727.16	100	5,228,507.33	95	165.44	8
AMESBURY	65.72	88	3,432,515.72	90	8,686,345.54	87	153.06	13
ANDOVER	83.90	32	5,941,113.50	74	14,672,401.87	69	146.96	15
ARLINGTON	84.45	31	19,456,532.20	29	40,008,595.94	28	105.63	64
ATHOL	69.84	77	1,853,579.49	101	3,643,150.01	102	96.55	77
ATTLEBORO	76.63	55	6,823,593.49	68	14,915,789.18	68	118.59	40
BARNSTABLE COUNTY	53.71	104	29,637,193.64	16	59,905,081.17	17	102.13	69
BELMONT	71.17	71	10,321,135.85	49	18,334,442.55	56	77.64	98
BERKSHIRE COUNTY	69.58	78	8,574,229.64	57	17,910,826.10	58	108.89	58
BEVERLY	65.20	90	10,115,394.69	50	20,997,214.79	54	107.58	62
BLUE HILLS REG VO	64.89	91	1,277,505.58	104	2,529,275.56	105	97.99	74
BOSTON	90.47	15	423,744,021.00	4	954,607,034.96	4	125.28	31
BRAINTREE	89.41	17	10,754,755.15	47	31,095,738.57	36	189.13	6
BRISTOL COUNTY	65.33	89	27,984,757.37	17	56,396,605.96	20	101.53	70
BROCKTON	68.80	81	31,391,928.11	15	58,818,647.18	19	87.37	88
BROOKLINE	72.53	67	24,876,676.68	21	48,680,116.77	22	95.69	81
CAMBRIDGE	79.06	45	51,938,113.94	8	108,235,272.77	8	108.39	60
CHELSEA	73.56	61	8,373,842.75	59	16,179,139.14	64	93.21	83
CHICOPEE	68.67	82	19,286,361.03	30	30,838,786.52	37	59.90	105
CLINTON	59.29	95	2,497,090.24	95	4,523,476.74	98	81.15	94
CONCORD	73.55	62	6,004,684.39	73	11,839,158.41	76	97.17	76
DANVERS	67.81	84	11,457,726.31	44	24,028,979.11	46	109.72	53
DEDHAM	91.23	14	5,372,444.97	78	11,916,540.71	75	121.81	34
DUKES COUNTY	57.23	99	2,484,233.89	96	4,935,448.34	96	98.67	73
EASTHAMPTON	84.97	27	2,335,419.30	97	6,291,567.64	93	169.40	7
ESSEX COUNTY	83.30	34	23,700,879.31	23	46,767,528.38	25	97.32	75
EVERETT	80.02	41	13,193,788.20	39	24,071,810.91	45	82.45	90

\* Funds became active in 1986



Massachusetts Contributory Retirement Systems  
for Public Employees

Table #5

	1985-1989 Cumulative		1984		1989		1985-1989 Percent	
	Return	Rank	Market Value	Rank	Market Value	Rank	Change	Rank
FAIRHAVEN	83.44	33	2,529,433.64	94	5,300,279.24	94	109.54	56
FALL RIVER	84.82	29	25,489,672.52	20	59,371,110.44	18	132.92	22
FALMOUTH	80.92	39	4,980,179.81	81	12,546,013.81	73	151.92	14
FITCHBURG	69.91	76	9,900,061.14	53	22,937,235.63	51	131.69	24
FRAMINGHAM	73.04	64	15,929,241.36	32	33,331,169.60	33	109.25	57
FRANKLIN COUNTY	55.91	101	5,292,301.98	80	10,878,513.62	80	105.55	65
GARDNER	84.60	30	4,239,443.26	84	8,821,094.74	85	108.07	61
GLOUCESTER	87.74	20	7,295,192.12	65	15,858,050.09	65	117.38	44
GREATER LAWRENCE	41.49	107	1,083,680.22	105	2,161,483.46	106	99.46	72
GREENFIELD	66.21	87	3,674,597.60	88	7,851,403.70	88	113.67	49
HAMPDEN COUNTY	79.93	42	21,933,175.13	25	47,433,159.67	23	116.26	45
HAMPSHIRE COUNTY	68.91	80	15,132,784.63	35	28,742,159.07	40	89.93	85
HAVERHILL	89.64	16	13,648,995.52	38	34,775,956.21	32	154.79	10
HINGHAM	81.04	38	6,198,079.44	72	10,855,691.07	81	75.15	99
HOLYOKE	94.23	11	19,853,191.27	28	38,995,458.71	29	96.42	79
HULL	57.74	98	2,791,757.32	92	4,667,081.51	97	67.17	103
LAWRENCE	70.43	74	17,085,202.61	31	35,350,858.02	31	106.91	63
LEOMINSTER	72.44	68	6,764,744.82	69	15,407,078.45	66	127.76	29
LEXINGTON	78.83	47	10,026,746.06	52	21,148,671.35	53	110.92	51
LOWELL	71.50	69	23,603,104.53	24	43,573,485.25	27	84.61	89
LYNN	78.41	48	25,664,505.38	19	65,147,923.16	15	153.84	12
MALDEN	74.92	57	14,553,491.13	36	25,231,070.40	44	73.37	100
MARBLEHEAD	67.41	86	8,070,072.74	62	13,039,912.51	71	61.58	104
MARLBOROUGH	73.16	63	5,875,278.80	76	13,001,509.15	72	121.29	35
MASS PORT AUTH	99.91	6	33,294,770.55	14	78,259,622.57	13	135.05	21
*MASS WATER RESOUR	42.63	106	35,031.12	107	6,457,088.49	92	18,332.44	1
MASS. HOUSING FIN	57.94	97	4,561,699.87	83	10,996,242.98	79	141.06	18

\* Funds became active in 1986

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #5

	1985-1989 Cumulative Return    Rank		1984 Market Value      Rank		1989 Market Value      Rank		1985-1989 Percent Change    Rank	
MASS. TURNPIKE AU	86.86	23	24,633,396.36	22	64,070,223.65	16	160.09	9
MAYNARD	62.07	92	2,234,567.81	98	4,012,857.69	99	79.58	96
MEDFORD	77.28	53	15,232,369.85	34	32,430,801.95	34	112.91	50
MELROSE	84.87	28	8,371,546.64	60	16,444,741.16	63	96.44	78
METHUEN	69.95	75	6,619,172.74	70	16,804,924.14	60	153.88	11
MIDDLESEX COUNTY	86.38	24	80,487,342.84	5	176,250,310.63	5	118.98	38
MILFORD	56.77	100	4,647,818.71	82	9,978,899.77	84	114.70	47
MILTON	88.35	19	7,895,116.94	63	16,554,000.58	62	109.67	54
MINUTEMAN REG VO	92.12	12	540,051.35	106	2,031,617.38	107	276.19	3
MONTAGUE	71.39	70	1,616,110.52	103	3,309,580.94	103	104.79	67
NATICK	87.18	22	9,612,899.85	55	22,257,438.91	52	131.54	25
NEEDHAM	101.02	4	10,069,021.25	51	29,240,130.59	39	190.40	5
NEW BEDFORD	53.87	103	26,806,278.26	18	51,046,721.26	21	90.43	84
NEWBURYPORT	61.66	93	3,415,248.46	91	7,758,481.77	89	127.17	30
NEWTON	77.47	52	52,627,047.02	7	89,994,230.72	12	71.00	101
NORFOLK COUNTY	100.25	5	50,989,157.64	9	111,403,574.99	7	118.48	41
NORTH ADAMS	73.92	59	4,002,319.68	87	8,796,871.18	86	119.79	37
NORTH ATTLEBORO	69.35	79	4,177,716.71	85	10,149,337.56	83	142.94	17
NORTHAMPTON	68.11	83	5,929,407.71	75	10,818,060.08	82	82.45	91
NORTHBRIDGE	81.43	37	1,708,871.75	102	3,087,852.85	104	80.70	95
NORWOOD	77.64	51	12,233,944.40	42	29,817,103.17	38	143.72	16
PEABODY	81.75	36	14,172,004.51	37	31,446,366.98	35	121.89	33
PITTSFIELD	73.68	60	15,418,671.05	33	27,531,215.60	43	78.56	97
PLYMOUTH	83.08	35	8,543,961.35	58	19,462,052.14	55	127.79	28
PLYMOUTH COUNTY	78.97	46	43,070,065.00	12	97,010,655.16	10	125.24	32
PRIM BOARD	103.30	2	494,803,177.00	3	2,892,810,269.15	3	484.64	2
QUINCY	54.59	102	37,398,851.20	13	70,437,144.50	14	88.34	87

\* Funds became active in 1986

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #5

	1985-1989 Cumulative Return Rank		1984 Market Value Rank		1989 Market Value Rank		1985-1989 Percent Change Rank	
READING	78.38	49	7,059,491.49	67	15,096,851.94	67	113.85	48
REVERE	52.75	105	11,134,867.63	45	23,479,791.75	48	110.87	52
SALEM	70.83	73	12,857,686.66	40	27,965,848.39	42	117.50	43
SAUGUS	75.64	56	5,320,006.55	79	11,590,305.86	78	117.86	42
SHREWSBURY	94.38	10	5,428,893.85	77	12,521,718.06	74	130.65	26
SOMERVILLE	71.12	72	20,589,396.65	26	44,222,604.40	26	114.78	46
SOUTHBRIDGE	60.83	94	2,653,342.30	93	3,693,569.09	100	39.20	107
SPRINGFIELD	78.05	50	50,698,307.90	10	99,065,948.40	9	95.40	82
STATE	91.49	13	1,906,229,111.00	2	3,740,770,753.82	2	96.24	80
STATE TEACHERS	89.03	18	2,082,212,078.31	1	3,798,278,620.93	1	82.42	92
STONEHAM	85.90	25	6,465,637.61	71	14,133,849.56	70	118.60	39
SWAMPSCOTT	85.21	26	3,662,608.10	89	7,640,286.26	90	108.60	59
TAUNTON	103.15	3	11,903,763.47	43	28,432,428.39	41	138.85	19
WAKEFIELD	99.23	7	8,292,784.34	61	17,012,511.58	59	105.15	66
WALTHAM	87.40	21	20,551,169.21	27	46,923,105.42	24	128.32	27
WATERTOWN	73.03	65	10,484,636.54	48	23,183,688.37	50	121.12	36
WEBSTER	58.51	96	2,178,138.15	99	3,683,430.21	101	69.11	102
WELLESLEY	97.64	8	10,902,829.58	46	38,287,444.13	30	251.17	4
WEST SPRINGFIELD	67.72	85	7,512,204.01	64	11,663,594.17	77	55.26	106
WESTFIELD	77.02	54	9,879,277.44	54	23,471,392.05	49	137.58	20
WEYMOUTH	112.67	1	12,751,171.03	41	24,027,427.60	47	88.43	86
WINCHESTER	79.58	43	7,161,297.27	66	16,665,899.70	61	132.72	23
WINTHROP	73.93	58	4,026,010.81	86	7,333,382.69	91	82.15	93
WOBURN	96.82	9	9,066,032.99	56	18,229,218.44	57	101.07	71
WORCESTER	80.44	40	63,278,049.69	6	132,622,336.34	6	109.59	55
WORCESTER COUNTY	79.07	44	45,642,279.60	11	93,132,466.00	11	104.05	68

\* Funds became active in 1986

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #5 Discussion

Table #5 indicates:

the 1985-1989 cumulative rate of return of each system and the system's ranking;

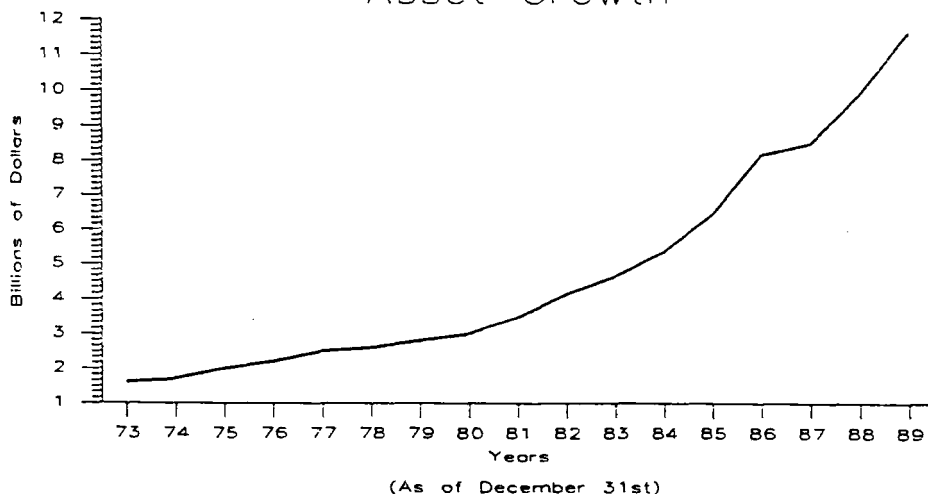
the December 31, 1984 market value of each system and the system's ranking (for State Employees' and Teachers' the December 31, 1985 market value is indicated);

the December 31, 1989 market value, including accrued income, of each system and the system's ranking; and

the percent change in market value of each system and the ranking of the percent change in market value.

This table includes information on the very significant growth of retirement system assets over the past five years. The cumulative return is the total income and appreciation earned by the investments of the retirement system. Market value growth includes employee and employer contributions. The percent change is the percent change in market value over the five year period. It should be noted that the market value of the PRIT Fund includes the market value of the participating and purchasing systems. The Massachusetts Contributory Retirement Systems had a cumulative investment return for the 1985-1989 period of 83.73%. The rate of growth in assets of the systems has been dramatic, reaching 100% over this five year period. On December 31, 1984 the assets of the Massachusetts Contributory Retirement Systems were \$5.8 billion. On December 31, 1989, these assets totalled \$11.6 billion. The growth of the assets of the Massachusetts Contributory Retirement Systems during the year 1989 exceeded that of 1988. The growth in assets during 1989 was 17.85% compared to the growth in assets in 1988 of 16.81%.

Massachusetts Pension System  
Asset Growth



Massachusetts Contributory Retirement Systems  
for Public Employees

Table #6

	Gross Perf.	Net Perf.	Basis Point Difference	Amount Appropriated	Amount Charged	Percent of Assets
ADAMS	11.52	11.42	10		4,551.00	0.09
AMESBURY	14.00			27,833.89		0.32
ANDOVER	13.26					
ARLINGTON	15.81	15.58	23	8,369.42	75,197.56	0.21
ATHOL	14.09	13.52	57		17,617.62	0.48
ATTLEBORO	19.11			34,075.91		0.23
BARNSTABLE COUNTY	9.15	8.62	53		276,519.71	0.46
BELMONT	17.03	16.44	59		88,740.49	0.48
BERKSHIRE COUNTY	10.49					
BEVERLY	10.28	10.00	28		48,403.13	0.23
BLUE HILLS REG VO	15.39	14.59	80		16,638.05	0.66
BOSTON	20.36	20.14	22	111,950.00	1,658,282.12	0.19
BRAINTREE	13.84	13.40	44		110,450.82	0.36
BRISTOL COUNTY	15.18	14.77	41		193,615.68	0.34
BROCKTON	11.62	11.27	35		181,464.42	0.31
BROOKLINE	19.78	19.45	33		120,486.00	0.25
CAMBRIDGE	10.95	10.65	30		288,226.58	0.27
CHELSEA	14.75	14.68	7		10,021.55	0.06
CHICOPEE	13.10	12.67	43		113,523.91	0.37
CLINTON	7.65	7.20	45		17,990.82	0.40
CONCORD	17.24	16.92	32		30,314.30	0.26
DANVERS	14.05			32,000.00		0.13
DEDHAM	16.43					
DUKES COUNTY	8.31					
EASTHAMPTON	16.51			31,520.34		0.50
ESSEX COUNTY	13.07			151,327.00		0.32
EVERETT	20.01	19.75	26		46,677.26	0.19

\* Funds became active in 1986

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #6

	Gross Perf.	Net Perf.	Basis Point Difference	Amount Appropriated	Amount Charged	Percent of Assets
FAIRHAVEN	16.59					
FALL RIVER	18.03	17.84	19		92,964.61	0.16
FALMOUTH	21.10	20.89	21		22,266.00	0.18
FITCHBURG	17.14			25,411.88		0.11
FRAMINGHAM	13.53	13.45	8	11,385.00	20,442.82	0.10
FRANKLIN COUNTY	11.95	11.68	27	14,872.00	25,000.00	0.37
GARDNER	16.97					
GLOUCESTER	13.23	12.73	50		63,978.00	0.40
GREATER LAWRENCE	11.36	10.79	57		10,406.98	0.48
GREENFIELD	15.28					
HAMPDEN COUNTY	15.12	14.75	37		142,852.50	0.30
HAMPSHIRE COUNTY	14.16	14.04	12		28,446.24	0.10
HAVERHILL	13.43	13.01	42		118,723.00	0.34
HINGHAM	14.69	14.62	7	2,970.78	6,619.58	0.09
HOLYOKE	13.13	12.68	45		151,802.43	0.39
HULL	9.39	8.98	41		16,404.59	0.35
LAWRENCE	19.04	18.45	59		165,545.00	0.47
LEOMINSTER	13.93			13,359.00		0.09
LEXINGTON	13.48	13.17	31		56,937.09	0.27
LOWELL	11.92	11.84	8		32,070.30	0.07
LYNN	17.50	17.23	27		136,704.00	0.21
MALDEN	20.33	20.01	32		67,407.00	0.27
MARBLEHEAD	18.96			36,521.00		0.28
MARLBOROUGH	14.08	13.61	47	8,316.00	52,508.00	0.47
MASS PORT AUTH	19.14			64,450.37		0.08
*MASS WATER RESOUR	14.60	14.23	37		15,830.21	0.25
MASS. HOUSING FIN	16.84					

\* Funds became active in 1986

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #6

	Gross Perf.	Net Perf.	Basis Point Difference	Amount Appropriated	Amount Charged	Percent of Assets
MASS. TURNPIKE AU	14.03			13,933.33		0.02
MAYNARD	5.94					
MEDFORD	14.70	14.51	19		50,066.75	0.15
MELROSE	16.27	15.96	31		39,543.58	0.24
METHUEN	13.21	12.94	27	12,399.25	36,382.50	0.29
MIDDLESEX COUNTY	16.33	15.90	43		616,775.25	0.35
MILFORD	16.95	16.81	14	18,616.91	10,861.56	0.30
MILTON	16.88					
MINUTEMAN REG VO	16.90					
MONTAGUE	16.39					
NATICK	17.21	17.18	3	26,800.00	6,145.39	0.15
NEEDHAM	16.84					
NEW BEDFORD	10.07	9.39	68		302,179.69	0.59
NEWBURYPORT	13.61	13.28	33		20,922.19	0.27
NEWTON	16.02	15.62	40		296,728.37	0.33
NORFOLK COUNTY	16.62					
NORTH ADAMS	19.79	19.45	34		23,525.00	0.27
NORTH ATTLEBORO	15.93	15.30	63		52,624.92	0.52
NORTHAMPTON	18.12	17.78	34		29,943.00	0.28
NORTHBRIDGE	16.99					
NORWOOD	17.01	16.89	12		27,941.39	0.09
PEABODY	13.43	12.99	44		120,491.00	0.38
PITTSFIELD	15.12	15.06	6		14,819.00	0.05
PLYMOUTH	16.18	15.89	29		44,755.64	0.23
PLYMOUTH COUNTY	12.83	12.81	2		17,615.28	0.02
PRIM BOARD **	17.90	16.96	94		22,912,436.00	0.79
QUINCY	13.43	13.05	38		231,534.34	0.33

\* Funds became active in 1986

\*\* See Discussion

Massachusetts Contributory Retirement Systems  
for Public Employees

Table #6

	Gross Perf.	Net Perf.	Basis Point Difference	Amount Appropriated	Amount Charged	Percent of Assets
READING	16.91					
REVERE	8.79	8.56	23		49,016.48	0.21
SALEM	12.86	12.37	49		120,274.79	0.43
SAUGUS	16.55					
SHREWSBURY	16.87					
SOMERVILLE	13.07	12.22	85	133.85	305,346.67	0.69
SOUTHBRIDGE	6.77					
SPRINGFIELD	19.93	19.78	15		120,000.00	0.12
STATE **	15.70					
STATE TEACHERS **	15.64					
STONEHAM	16.13	15.56	57		64,255.50	0.45
SWAMPSCOTT	18.93	18.62	31		19,021.00	0.25
TAUNTON	16.83	16.39	44		103,037.97	0.36
WAKEFIELD	16.04					
WALTHAM	20.97			92,223.61		0.20
WATERTOWN	13.10			83,249.75		0.36
WEBSTER	5.43	5.26	17		5,664.46	0.15
WELLESLEY	17.64			150,510.13		0.39
WEST SPRINGFIELD	16.51	16.27	24		21,003.00	0.18
WESTFIELD	16.86	16.80	6		11,238.04	0.05
WEYMOUTH	16.69					
WINCHESTER	15.75	15.28	47		58,213.24	0.35
WINTHROP	16.58	16.51	7		4,401.00	0.06
WOBURN	13.06	12.93	13		20,706.00	0.11
WORCESTER	14.39	14.28	11		121,900.60	0.09
WORCESTER COUNTY	10.30					

\* Funds became active in 1986

\*\* See Discussion



Massachusetts Contributory Retirement Systems  
for Public Employees

Table #6 Discussion

Table #6 indicates:

- the gross rate of return of each system in 1989;
- the net rate of return of each system in 1989;
- the basis point difference in gross and net performance;
- the amount appropriated and paid from the expense fund for management fees for investment managers;
- the amount charged to investment income for management fees for investment managers; and
- the amount paid for management fees for investment managers as a percent of assets.

This table contains information on management fees paid to investment managers. The question a board must ask is does the investment manager's performance justify the fee being paid. Again, this must be looked at in consideration of the objectives and asset allocation the board has set and in consideration of the manager's performance in the asset classes managed.

One area where a board can control costs is in the establishment of management fees. Generally, the more assets under management by a manager, the lower the overall rate paid. An important question to consider is whether the fee being paid is similar to that being paid by other clients with a similar asset base.

PERA regulations allow for the payment of management fees from investment income and this form of payment is common in the investment community. If payment is made by the board from the expense fund, there is no influence on the return of the retirement system.

Certain types of investments are reported net throughout this report. These investments include mutual funds, group trusts, limited partnerships, and guaranteed investment contracts. The information on management fees paid is based on information provided by each retirement board in its annual statement on file at the Division of Public Employee Retirement Administration.

It must be noted that the PRIT Fund currently charges all operating costs of the fund against investment income and in 1989 charged retroactive management fees against investment income. Of the \$22,912,436.00 charged against investment income, \$10,976,576.00 was for management fees (.38 percent of assets), \$8,500,000 was for

retroactive management fees (.29 percent of assets) and \$3,435,860.00 was for other operating costs of the fund (.12 percent of assets). It must also be noted that the performance of the retirement systems holding shares of the PRIT Fund is reported net throughout this report. Share values for the shares of the PRIT Fund are reported net of expenses to the holders of the shares.

The performance of the State Employees' Retirement System and the Teachers' Retirement System, which hold shares of the MASTERS Trust, is reported net throughout this report. Share values for the shares of the MASTERS Trust are reported net of expenses to the holders of the shares. The MASTERS Trust earned 16.23% on a gross basis as reported by the Office of the Treasurer. The MASTERS Trust charged \$9,079,140 against investment income (.20 percent of assets) which includes \$6,824,389.41 for management fees (.15 percent of assets) and \$2,254,750.59 for other operating costs of the fund (.05 percent of assets). The MASTERS Trust is statutorily authorized to charge all operating costs of the fund to investment income.

The performance of the Massachusetts Contributory Retirement Systems, which includes the expenses incurred by the systems participating in the PRIT Fund and excludes the State Employees' and Teachers' Retirement Systems, was 16.18% on a gross basis and 15.73% on a net basis. This represents a difference of 45 basis points.

The total expenses paid to investment managers for all the Massachusetts Contributory Retirement Systems, including those expenses paid by the PRIT Fund to investment managers, totalled \$34,810,757.80 or .30 percent of assets. The total expenses paid for all the Massachusetts Contributory Retirement Systems, including those expenses paid by the PRIT Fund, totalled \$40,501,368.39 or .35 percent of assets.

Massachusetts Contributory Retirement Systems  
for Public Employees

Appendix 1

The following is a list of each contributory retirement system and the investment managers retained by each system through December 31, 1989.

Adams      E.R. Taylor Investments (5/25/89)

Amesbury   Boston Advisory Group (4/17/85 - formerly Richard H. Morse  
Investors)

Andover    Hawthorne Associates (8/31/89)

Arlington  
            Constitution Capital Management (3/5/85)

Athol      Shawmut/Worcester County (6/25/85)  
            PaineWebber Properties, Inc. (12/22/88 - real estate)

Attleboro  
            BayBank Inc. (4/1/85)  
            PaineWebber Properties, Inc. (12/22/88 - real estate)

Barnstable County  
            Aetna Capital Mgmt. (7/27/89)  
            Boston Company (7/27/89)  
            Aetna Capital Mgmt. (7/27/89 - real estate)  
            Aetna Capital Mgmt. (7/27/89 - international)  
            Lombard Odier (12/21/89 - international)

Belmont    The system received its original "legal list" waiver on  
            March 26, 1985 with the de Burlo Group as investment  
            manager. The system purchased shares of the PRIT Fund on  
            May 24, 1989. Belmont changed its investment manager and a  
            new waiver was granted on June 30, 1989 with Oppenheimer  
            Capital as investment manager.

Berkshire County  
            The system is a "Legal List" system and invests pursuant to  
            the provisions of Chapter 32. On February 23, 1987, the  
            system purchased shares of the PRIT Fund.

Beverly    Aetna Capital Mgmt. (8/31/89)  
            Massachusetts Financial Services (8/31/89)  
            Aetna Capital Mgmt. (8/31/89 - real estate)  
            Aetna Capital Mgmt. (8/31/89 - international)

Blue Hills Regional  
            David L. Babson (4/12/85)

Boston     Avatar Associates (11/14/86)  
            Back Bay Advisors (9/7/89)  
            Bear Stearns, Inc. (2/4/87)

Boston    Constitution Capital Management (12/12/88)  
          Criterion Investment Management (9/14/89)  
          Eagle Asset Mgmt. (11/14/86)  
          Loomis Sayles & Co. (9/7/89)  
          Mass Financial Services (9/7/89)  
          Richmond Capital Mgmt. (9/7/89)  
          Siebel Capital Mgmt. (9/7/89)  
          State Street Bank & Trust (12/12/88)  
          Wellington Mgmt. Co. (2/21/85)  
          Heitman Advisory Corp. (11/17/89 - real estate)  
          JMB Institutional Realty (11/17/89 - real estate)  
          Metric Institutional Realty (9/7/89 - real estate)  
          MIG Realty Advisors (12/19/89 - real estate)  
          Schroder Real Estate Capital (11/17/89 - real estate)  
          Boston Company (11/14/86 - international)  
          Oechsle International Advisors (6/30/87 - international)  
          Warburg Investment Mgmt. International Ltd. (7/15/87 - international)

Supplementary regulations were approved for the following investments prior to the waiver process:

Frank Russell Trust (real estate)  
LaSalle Advisors I & II (real estate)  
Lomas & Nettleton (real estate)  
Property Capital Advisors (real estate)  
Public Storage (real estate)  
Copley Partners I & II (venture capital)

A waiver granted to Boston on February 21, 1985 with Capitol Bank as investment manager was withdrawn December 7, 1988.

#### Braintree

The system received its original "legal list" waiver on April 1, 1985 with the Shawmut Bank of Boston as investment manager. On September 9, 1986 the system changed its investment manager. 1838 Investment Advisors has served Braintree as investment manager since September 9, 1986.

#### Bristol County

The system received its original "legal list" waiver on March 25, 1985 with the de Burlo Group as investment manager. Bristol County changed investment managers and has been granted waivers with the following investment managers:

Aetna Capital Mgmt. (2/23/89)  
BayBank (3/16/88)  
Aetna Capital Mgmt. (2/23/89 - real estate)  
Aetna Capital Mgmt. (2/23/89 - international)

A supplementary regulation was approved for the following investment prior to the waiver process:

Palmer Organization (venture capital)

**Brockton**

Fort Hill (3/22/85)  
Freedom Capital Mgmt. Corp. (6/7/89)  
Loomis Sayles & Company (6/7/89)  
Marathon Investment Mgmt. (6/7/89)

**Brookline**

State Street Research (6/26/86)  
State Street Research (8/24/89 - international)

The system purchased shares of the PRIT Fund on September 29, 1989.

**Cambridge**

The system is a "Legal List" system and invests pursuant to the provisions of Chapter 32. The system received a partial waiver on May 19, 1988 with APT Financial Services as real estate manager.

**Chelsea** The system received a "legal list" waiver on March 4, 1987 with Keystone Investment Management Corporation as investment manager. In April 1988 Chelsea withdrew its waiver and invested under the "legal list" standard. A new waiver was granted on August 24, 1989 with BayBank as investment manager.

**Chicopee**

Federal Street Financial Advisers (11/24/89)  
Freedom Capital Mgmt. Corp. (6/26/86)  
Leonard Management Group (3/21/88)

**Clinton** The system is a "Legal List" system and invests pursuant to the provisions of Chapter 32. In its 1986 annual statement Clinton listed Alex Brown as investment manager. Its 1987 and 1988 annual statements do not list an investment manager. In the 1989 annual statement, Clinton listed Aetna as investment manager.

**Concord** Constitution Capital Mgmt. (5/21/86)  
Frank Russell Trust Company (5/21/86)

**Danvers** Boston Advisory Group (4/3/85 - formerly Richard H. Morse Investors)

The system purchased shares of the PRIT Fund on August 18, 1987.

**Dedham** In its 1986 and 1987 annual statement Dedham listed Aetna as its investment manager. On June 1, 1988 Dedham transferred into the PRIT Fund.

**Dukes County**

The system is a "Legal List" system and invests pursuant to the provisions of Chapter 32.

Easthampton

Heritage Bank for Savings/Wright Investors Service (4/12/85  
- Heritage Bank for Savings was formerly Northampton  
Institute for Savings)

Essex County

Freedom Capital Mgmt. Corp. (5/6/85)

Everett BayBank Inc. (2/15/85)

Fairhaven

PRIT Fund (7/1/86)

Fall River

BayBank Inc. (8/27/85)

Falmouth

State Street Bank (4/3/85)

Fitchburg

First Safety Fund National Bank (4/19/85)

Framingham

The system is a "Legal List" system and invests pursuant to the provisions of Chapter 32. The system purchased shares of the PRIT Fund on November 28, 1986.

Franklin County

The system received its original "legal list" waiver on December 2, 1985 with the de Burlo Group as investment manager. The waiver was revoked on January 27, 1988 when the system terminated its investment manager. A new waiver was granted on March 31, 1988 with Freedom Capital Mgmt. Corp. as investment manager.

Gardner The system received a "legal list" waiver on May 21, 1985 with the Shawmut Bank of Boston as investment manager. On December 1, 1986 Gardner transferred into the PRIT Fund.

Gloucester

Freedom Capital Mgmt. Corp. (4/19/85)

Greater Lawrence Sanitary District Authority

Shawmut/Arlington Trust. (7/29/86)

Greenfield

Bank of New England - West (7/29/86)  
PaineWebber Properties, Inc. (4/17/89 - real estate)

The system purchased shares of the PRIT Fund on February 25, 1987.

Hampden County

Boston Company (8/16/85)  
Freedom Capital Mgmt. Corp. (10/13/88)

#### Hampden County

The system received its original "legal list" waiver on April 11, 1985 with Rollert & Sullivan as its investment manager. The waiver was revoked on July 31, 1985 when the system terminated its investment manager.

#### Hampshire County

The system received its original "legal list" waiver on April 11, 1985 with Bank of New England - West as investment manager. On October 26, 1989 Hampshire County changed investment managers, and the system currently invests with Constitution Capital Management as investment manager.

#### Haverhill

Boston Company (7/8/85)  
Lehndorff & Babson (10/27/88 - real estate)  
Babson-Stewart Ivory (8/17/89 - international)

#### Hingham Constitution Capital Management (12/11/86)

The system purchased shares of the PRIT Fund on May 1, 1986.

#### Holyoke David L. Babson Company (12/6/85) Freedom Capital Mgmt. Corp. (12/6/85) Leonard Management Group (8/20/86)

A waiver granted to Holyoke on December 6, 1985 with Ray Depelteau as investment manager was withdrawn in January 1988 when Mr. Depelteau left the retirement system.

#### Hull Fort Hill Investors (7/8/85)

#### Lawrence

National Investment Services of America (1/24/86)

#### Leominster

First Safety Fund National Bank (4/1/85)

#### Lexington

Wellington Management Company (1/25/89)

#### Lowell The system received a "legal list" waiver on June 6, 1985 with BayBank as investment manager. The waiver was revoked on November 13, 1985 when the system terminated its investment manager and Lowell invested under the "legal list" standard. The system purchased shares of the PRIT Fund on July 10, 1987. In 1989 Lowell was granted investment waivers with the following investment managers:

Consistent Asset Management (9/14/89)  
Constitution Capital Management (9/14/89)  
J.L. Kaplan Associates (9/14/89)  
One Federal Asset Management (9/14/89)  
Shurgard Realty Advisors (4/6/89 - real estate)

Lynn de Burlo Group (3/26/85)

A supplementary regulation was approved for the following investment prior to the waiver process:

Palmer Organization (venture capital)

Malden de Burlo Group (3/27/85)

Marblehead  
de Burlo Group (4/3/85)

Marlborough  
Freedom Capital Mgmt. Corp. (6/23/88)

Mass. Housing Finance Agency  
PRIT Fund (6/1/87)

Mass Port Authority  
Wellington Management Company (2/7/85)  
Wellington Management Company (11/24/89 - international)

A supplementary regulation was approved for the following investment prior to the waiver process:

Copley Partners I & II (venture capital)

Mass Turnpike Authority  
The system is a "Legal List" system and invests pursuant to the provisions of Chapter 32. The 1989 annual statement listed S.J. Britton Investment Counsel as investment manager.

Mass Water Resources Authority  
Boston Company (2/11/88)

The system purchased shares of the PRIT Fund on January 6, 1988.

Maynard The system is a "Legal List" system and invests pursuant to the provisions of Chapter 32. The 1988 and 1989 annual statements listed Alex Brown & Sons as investment manager.

Medford Constitution Capital Management (3/14/85)

Melrose Constitution Capital Management (4/3/85)  
Lehndorff & Babson (7/27/89 - real estate)

Methuen David L. Babson (10/16/86)

The system purchased shares of the PRIT Fund on April 1, 1988.



**Middlesex County**

Boston Company (3/6/86)  
Constitution Capital Management (3/26/85)  
Gardner & Preston Moss, Inc. (9/28/89)  
Income Research & Mgmt. (9/28/89)  
Oppenheimer Capital (8/25/87)  
Siebel Capital Mgmt. (9/28/89)

A waiver granted to Middlesex County with Putnam Advisory Co. as investment manager on March 6, 1986 was withdrawn September 1, 1989.

A supplementary regulation was approved for the following prior to the waiver process:

APT Financial Services (real estate)

**Milford** BayBank Inc. (1/18/89)

**Milton** PRIT Fund (7/1/86)

**Minuteman Regional**  
PRIT Fund (7/1/85)

**Montague**

The system received a "legal list" waiver on March 5, 1986 with Gardner & Preston Moss, Inc. as investment manager. On July 1, 1986 Montague transferred into the PRIT Fund.

**Natick** United Investment Council (3/14/85)

**Needham** The system received a "legal list" waiver on March 12, 1985 with Fort Hill as investment manager. On July 1, 1985 Needham transferred into the PRIT Fund.

**New Bedford**

The system received its original "legal list" waiver on August 2, 1985 with Shawmut/Bristol County as investment manager. On October 9, 1986 New Bedford withdrew its waiver and invested under the "legal list" standard. In 1989 New Bedford was granted waivers with the following investment managers:

Aetna Capital Mgmt. (6/15/89)  
Massachusetts Financial Services (6/15/89)  
Aetna Capital Mgmt. (6/15/89 - real estate)  
Aetna Capital Mgmt. (6/15/89 - international)  
Lombard Odier (9/28/89 - international)

**Newburyport**

Boston Advisory Group (3/28/85 - formerly Richard H. Morse Investors)

Newton The system received its original "legal list" waiver on March 4, 1985 with Standish, Ayer & Wood as investment manager. Newton changed its investment manager to the following investment managers:

Boston Company (3/19/87)  
1838 Investment Advisors (3/19/87)  
Freedom Capital Mgmt. Corp. (3/19/87)  
Loomis, Sayles & Company (3/19/87) Norfolk County  
PRIT Fund (11/1/85)

Norfolk County  
PRIT Fund (11/1/85)

North Adams  
de Burlo Group (3/25/85)

North Attleboro  
Keystone Investment Management Corp. (2/10/87)  
PaineWebber Properties, Inc. (10/27/88 - real estate)

Northampton  
de Burlo Group (4/18/85)

Northbridge  
The system received its original "legal list" waiver on April 4, 1985 with Shawmut/Worcester County as investment manager. On January 1, 1988 Northbridge transferred into the PRIT Fund.

Norwood Constitution Capital Management (3/5/85)  
Dean Witter Dividend Growth Securities, Inc. (11/2/89)  
Manufacturers Life Insurance Equity Fund A (11/2/89)  
MFS Lifetime Capital Growth Trust (11/17/89)  
Dean Witter Realty Yield Plus L.P. (11/2/89 - real estate)

The system purchased shares of the PRIT Fund on August 13, 1987.

Peabody Freedom Capital Mgmt. Corp. (7/8/85)

Pittsfield  
The system was originally granted waivers with the de Burlo Group and Lawrence Grizey as investment managers. The waiver granted the system on December 11, 1986 with Lawrence Grizey as investment manager was withdrawn on January 15, 1988 with the retirement of Mr. Grizey. Pittsfield withdrew its waiver with the de Burlo Group in May 1989. A new waiver was granted on June 15, 1989 with Freedom Capital Management Corp. as investment manager.

Plymouth  
State Street Bank (2/24/89)

Plymouth County

The system received a partial waiver from the "legal list" restrictions allowing 50% of the portfolio to be invested under a "prudent person" standard rather than under the "legal list" limitations. In 1989 Plymouth County was granted partial waivers with regard to real estate and international investments, and currently invest with the following investment managers:

John McLellan (5/14/85 - partial waiver)  
Lehndorff & Babson (5/4/89 - real estate)  
Metric Institutional Realty (10/5/89 - real estate)  
Shurgard Realty Advisors (5/4/89 - real estate)  
Babson-Stewart Ivory (5/4/89 - international)

Quincy The system received its original "legal list" waiver on May 22, 1985 with South Shore Bank as investment manager. Quincy withdrew this waiver in January 1989, and in February 1989 was granted waivers with the following investment managers:

Mass Financial Services (2/9/89)  
M.D. Sass Investors Co. (2/9/89)

Reading The system received its original "legal list" waiver on June 30, 1985 with the de Burlo Group as its investment manager. Reading transferred into the PRIT Fund on June 1, 1988.

Revere The system received a partial waiver from the "legal list" restrictions on May 14, 1985 with Fort Hill as investment manager. On March 27, 1987 Revere received a full waiver with Fort Hill continuing as their investment manager.

Salem Freedom Capital Mgmt. Corp. (11/17/88)  
Shawmut Bank of Boston (4/2/85)  
PaineWebber Properties, Inc. (11/17/88 - real estate)

Saugus PRIT Fund (7/1/86)

Shrewsbury

The system received a "legal list" waiver on February 12, 1985 with BayBank as the system's investment manager. On July 1, 1985 Shrewsbury transferred into the PRIT Fund.

Somerville

The system is a "Legal List" system and invests pursuant to the provisions of Chapter 32. In its 1986 annual statement Somerville listed Alex Brown as investment manager. Its 1987, 1988 and 1989 annual statements do not list an investment manager.

Southbridge

Freedom Capital Mgmt. Corp. (11/9/89)

Springfield

The system received its original "legal list" waiver on May 6, 1985 with the Bank of New England - West as investment manager. Springfield changed its investment manager and a new waiver was granted on October 13, 1987 with BayBank as investment manager.

Stoneham

David L. Babson Co. (7/26/85)  
Lehndorff & Babson (11/17/88 - real estate)

Swampscott

de Burlo Group (3/27/85)

Taunton

U.S. Trust Company (6/25/85)  
Lehndorff & Babson (12/21/89 - real estate)

Wakefield

PRIT Fund (7/1/85)

Waltham

BayBank Inc. (2/11/85)

Watertown

Boston Company (3/19/85)  
Gardner & Preston Moss, Inc. (10/5/89)  
Lehndorff & Babson (10/5/89 - real estate)

Webster

The system is a "Legal List" system and invests pursuant to the provisions of Chapter 32. The 1988 and 1989 annual statements listed Alex Brown & Sons as investment manager.

Wellesley

Standish Ayer & Wood (2/27/85)

West Springfield

Shawmut First Bank & Trust (2/21/86)

Westfield

Bank of New England - West (4/4/85)  
PaineWebber Properties, Inc. (11/17/88 - real estate)

Weymouth

PRIT Fund (10/1/84)

Winchester

Tucker Anthony/R.L. Day (5/6/86)

Winthrop

Constitution Capital Management (3/12/85)

Woburn

David L. Babson (3/21/88)

Worcester

Bank of New England - Worcester (1/14/87)  
Frank Russell Trust Company (5/5/86)

## Worcester

The system purchased shares of the PRIT Fund on December 30, 1986. A waiver granted Worcester, with Trident Investment Mgmt. as investment manager on May 5, 1986, was voided in April 1989 when the system terminated the investment manager. A waiver granted Mechanics Bank on October 16, 1986 was withdrawn in December 1989.

## Worcester County

The system is a "Legal List" system and invests pursuant to the provisions of Chapter 32.

The State Employees' and Teachers' Retirement Systems hold units in MASTERS Trust. The managers for MASTERS Trust as of December 31, 1989 were as follows:

Constitution Capital Management (equity)  
Gardner, Preston & Moss (equity)  
J.M. Hartwell (equity)  
Keystone Investment Management (equity)  
IDS Advisory Group (equity)  
Independence Investment Association (equity)  
Invesco Capital Management (equity)  
Manufacturers Life Insurance Company (equity)  
Mass Financial Services (equity)  
One Federal Asset Management (equity)  
State Street Bank & Trust (equity)  
State Street Research (equity)  
Trinity Investment Management (equity)  
Wellington Management Company (equity)

Guinness Mahon Investment LTD (international)  
Wardley Investment Services Int'l (international)

Cambridge Financial Management (international hedge)

Bailaird, Biehl & Kaiser (balanced fund)

The Four Seasons Fund (future manager)  
Pru-Bache Future Fund (future manager)  
Shearson Lehman (future manager)

Beta Partners Ltd. (venture capital)  
Clayton & Dubilier (venture capital)  
Fontenac Venture LTD Partnership (venture capital)  
John Hancock Venture Capital (venture capital)  
Narragansett Capital Partnership (venture capital)  
New Enterprise Associates IV (venture capital)  
Prudential Limited (venture capital)  
TA Associates (venture capital)  
Vista III LTD Partnership (venture capital)  
WCAS Capital Partners (venture capital)

Aetna Life Insurance Company (real estate)  
Copley Real Estate (real estate)  
Franklin Real Estate Income (real estate)  
First Chicago (real estate)  
John Hancock Real Estate (real estate)  
Lehndorff & Babson (real estate)  
Pru-Bache Security (real estate)  
Public Storage (real estate)  
Shurgard Institutional (real estate)  
Sierra Capital (real estate)  
State Street Real Estate (real estate)

The managers for the PRIT Fund as of December 31, 1989 were as follows:

Alliance Capital  
Baring America Asset Management Co. Ltd.  
Bear Stearns & Company  
Lazard Freres  
Lehman Management Co., Inc.  
M.D. Sass Investors  
One Federal Asset Management  
Panagora  
Putnam Advisory Company  
Trinity  
U.S. Trust

Acadian Asset Management (international)  
Baring International Ltd. (international)  
G.E. Investment Management (international)  
H.D. International (international)  
N.M. Rothschild Asset Management Ltd. (international)  
Nomura Capital Management Inc. (international)  
Oechsle International Advisors (international)  
Schroder Capital Management (international)  
Scudder, Stevens & Clark (international)  
State Street Bank & Trust (international)

Advent ESSF (special equity)  
Boston Ventures (special equity)  
Forstmann Little (special equity)  
Invexco (special equity)  
Kohlberg, Kravis & Roberts (special equity)  
MMG Patricof Group PLC (special equity)  
Schroder U.K. Buy-Out Fund II (special equity)  
Smith Offshore (special equity)  
Weintraub Entertainment (special equity)

Advent International (venture capital)  
APA Ventures (venture capital)  
Commonwealth Bioventure (venture capital)  
Davis Venture Partners (venture capital)  
Golder, Thoma & Cressey (venture capital)

John Hancock Venture Partners (venture capital)  
Morgan Holland (venture capital)  
MTDC (venture capital)  
Southern California Venture Partners (venture capital)  
TA Associates (venture capital)  
Venture Capital of New England (venture capital)  
Vista Partners (venture capital)

Aldrich, Eastman & Waltch (real estate)  
American Properties Team Inc. (real estate)  
Boston Financial Group (real estate)  
Copley Real Estate (real estate)  
First National Bank of Boston (real estate)  
John Hancock Apartment Fund (real estate)  
Heitman Advisory Group (real estate)  
JMB Institutional Realty (real estate)  
Lomas & Nettleton (real estate)  
Mass Mutual (real estate)  
TCW Realty (real estate)

## **PENSION INVESTMENT ADVISORY UNIT**

**LISA R. REIBSTEIN**  
Director

**RONALD A. HELDORFER**  
Assistant Director

**ROBERT P. SHAW**  
Assistant Director

## **INVESTMENT ANALYSTS**

**VICTORIA MARCORELLE**  
**JUSTIN MALLAHAN**  
**MARY J. McNAMARA**

**ROSE CIPRIANI**  
Administrative Assistant



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